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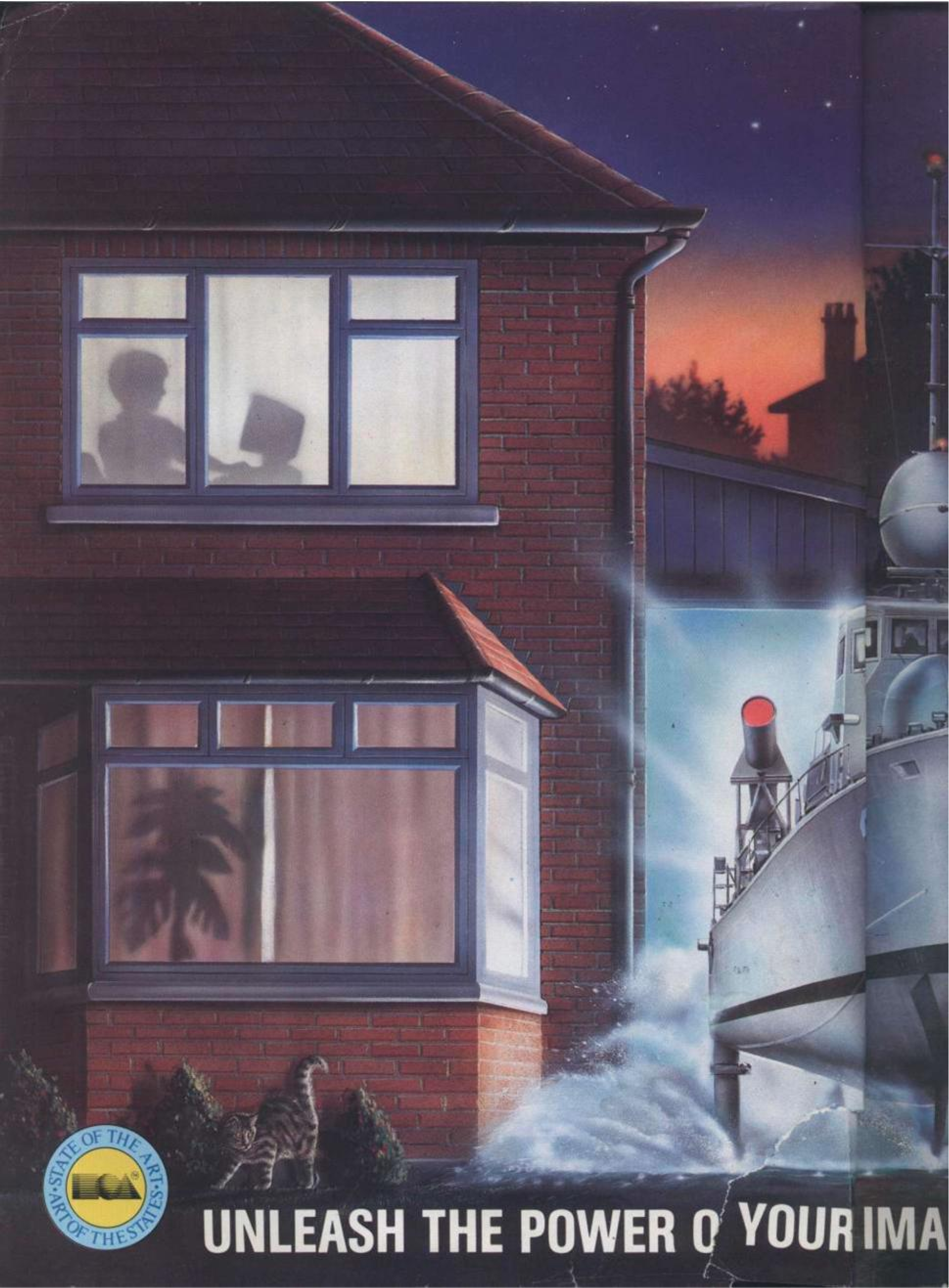
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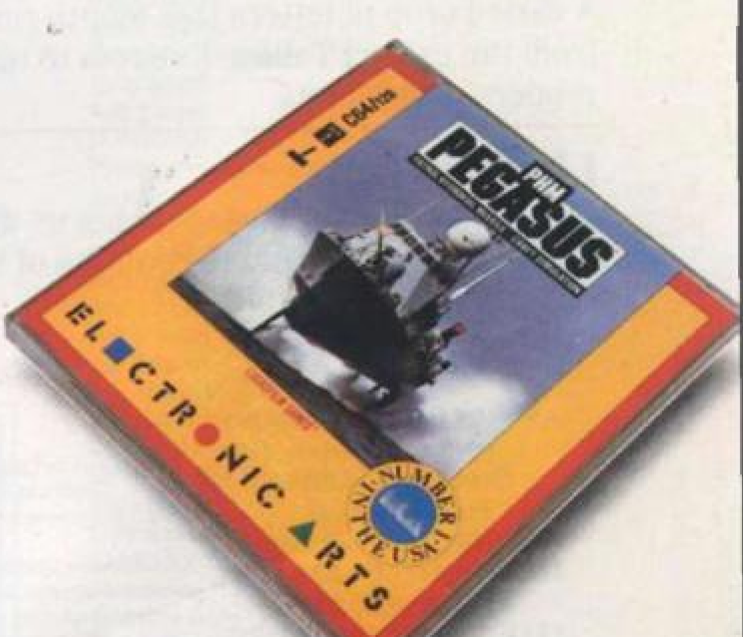
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contents

OCTOBER 1987



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Back issues of the magazine from January 1986 onwards are available for £2.00 (U.K.), £3 (Overseas) from the Back Issues Department, Greencoat House, Francis Street, London SW1P 1DG.

FEATURES

SOFTWARE TOOLS

NEXT MONTH
The November issue of *Your Computer* includes details of how you can make your Atari ST emulate many other machines, including a Macintosh, and IBM PC, a BBC Micro or a CP/M micro. We review the improved Amstrad PCW word processor and a sound sampler for the Amiga. On sale 8th October.



COMMENT

A few years ago one of the most frequent enquiries received by *Your Computer* was why software written for one computer would not run on another. We daydreamed of a universal machine able to run all software.

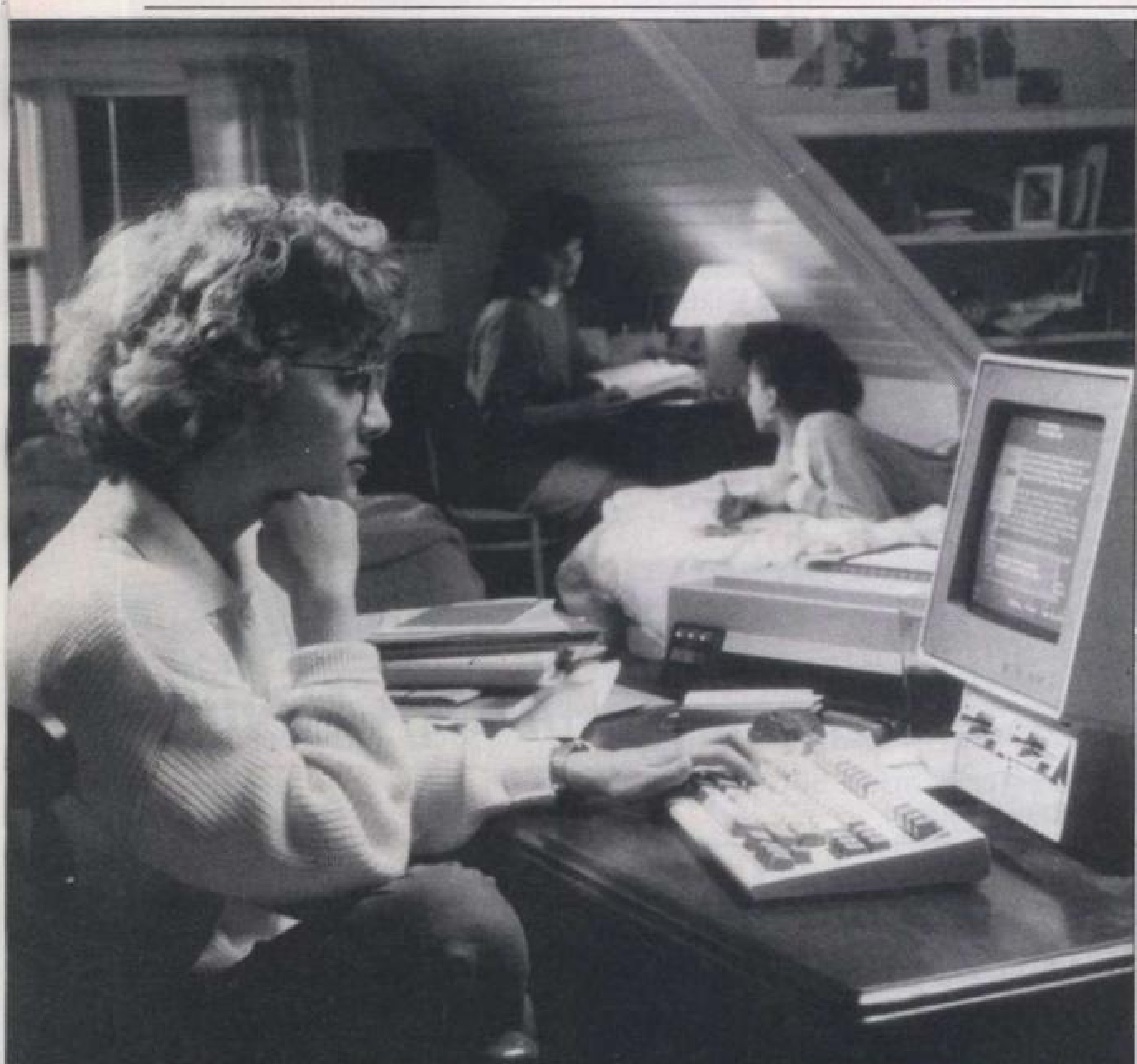
Now it seems that the universal computer might some day become real.

Currently we have an Atari ST which will run Atari, BBC, IBM, CP/M and Macintosh software. Where the central processor is inappropriate, the 68000 has enough power to emulate the 8088, 6502 or Z80. RISC processors will soon give even more scope for machine emulations, and increasing standardisation on 3½ inch disk drives should solve media mismatches.

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YOUR COMPUTER NEWS



Fantasy game from Origin

US software house Origin Systems, which opened up shop over here earlier this year, has launched Moebius, a fantasy/role play game for the 64. Play takes place on four different planes, each with different challenges to be overcome. Polish up your martial arts, magic, courage and cunning and you get to retrieve the Celestial orb of Harmony. Apple, IBM, Amiga and ST versions are due out later in the year.

In business

Activision is apparently back in business, showing a profit of over $500,000 for the quarter to the end of June. This is the first time in four years the games company has been in the black. The reasons for the turnaround are related to a sudden attack of 'back to basics' the company experienced earlier this year. Effectively this has meant a greater emphasis on games that will sell than on games that are amazing, and in this country this has meant the company scoring several hit games over the past few months.

A side-effect of this may however annoy adventure purists. Infocom, which Activision bought some while back and which is generally regarded as the Rolls Royce of adventure software houses, is to add graphics and sound to its product. To the dyed-in-the-wool adventurist this is a bit like adding colour to Casablanca . . .

IBM launches low cost PS/2

IBM has launched the model 25, a low-cost entry-level machine tucked at the bottom of its PS/2 range. It is however initially aimed at the US educational market, and therefore may not make it across the pond to the UK in the near future.

The US price of $1350 is not particularly cheap by the standards of the market, but is by IBM's standards. Big Blue is also offering educational discounts of 45 per cent, which bring it down to $742, and as this translates to about £400 it shows that the company could, if it wanted, give the likes of Amstrad serious gyp.

The machine is 'nobbled' so that it doesn't clash with the pricier PS/2 machines, but not as spectacularly as IBM's previous educational effort, the PC Junior. The model 25 comes as a Macintosh-like two-box unit, of keyboard and monitor/system case, and hence won't take extension monitors. Similarly its memory is limited to 640K. Standard version comes with 512K RAM, mono screen and single 720K disk drive.

Electronic Arts launches game in UK

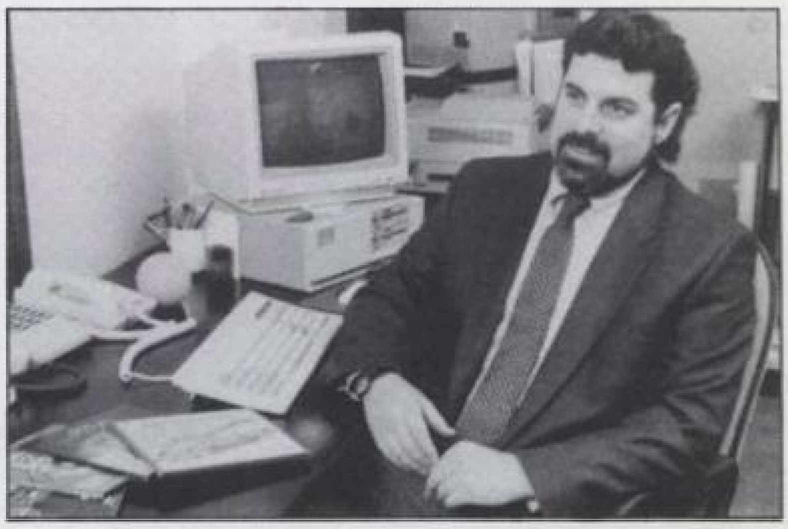
The top U.S. games software publishing house Electronic Arts has started business in the U.K. Its European headquarters have been established in Langley, Berks and at present are being headed by two American EA executives, Mark Lewis who is Director of European Publishing and David Gardener, a producer (EA likes to draw an analogy between itself and film companies).

With the intention of releasing about a dozen titles a month until Christmas, EA is putting on the market everything from arcade-style games such as *One on One* to *Starflight 1*, a simulation with about 200 hours worth of playing time on it.

The packaging of the games is to differ from the much-imitated album-style covers used in the U.S. Instead we will have a case the size of compact disks, decorated with yellow borders. Colour and numerical coding is also to be found on the design but EA is leaving it up to the customers to work out exactly what it signifies!

In addition to games, EA is also launching its Deluxe range. This includes the best-selling Deluxe Paint, a graphics package which can be used for design mock-ups by studios (a package for "art-processing" as Mark Lewis puts it) and Deluxe Print which can reproduce artwork to the same standards and print it on to letterheads, postcards, wrapping paper and so on.

Programs in this series, including Deluxe Video which helps create graphic images on video and Deluxe Music Construction Set, a musical composition tool, will cost between £59.00 and £79.00. At present they cost £130 in their imported versions. Much of the reason for the reduction in price is that EA operates without a distributor, thus cutting out the share given to the middle man.



Lewis hopes that this approach will prompt a growth in the dealer market rather than send other software companies out of business. "We're not out to gun down our competitors," he says. He is also trying to promote creativity by encouraging programmers to send him their ideas. EA has a good record with its programmers – in four years only one has left for another company and that was because EA had decided to stop work on the Macintosh.

The company has already signed up some of the best programming talent in England although exactly whom it is not yet prepared to say. This trend is likely to continue because Lewis believes that Europeans are masters of graphics and sound. "People like Jez Sans already are stars in Britain," he says. Whether such luminaries wish to become stars with EA remains to be seen.

Olivetti has Don's blessing

Fancy an Olivetti M24 with 20 megabyte hard disk for £1300? This Amstrad-like price was previously only available from a discount merchant who'd just had an exceedingly good lunch, but the Don has now apparently given the Italian company his blessing to shift the old box at a price that'll bring a tear to the eye of many a weary dealer.

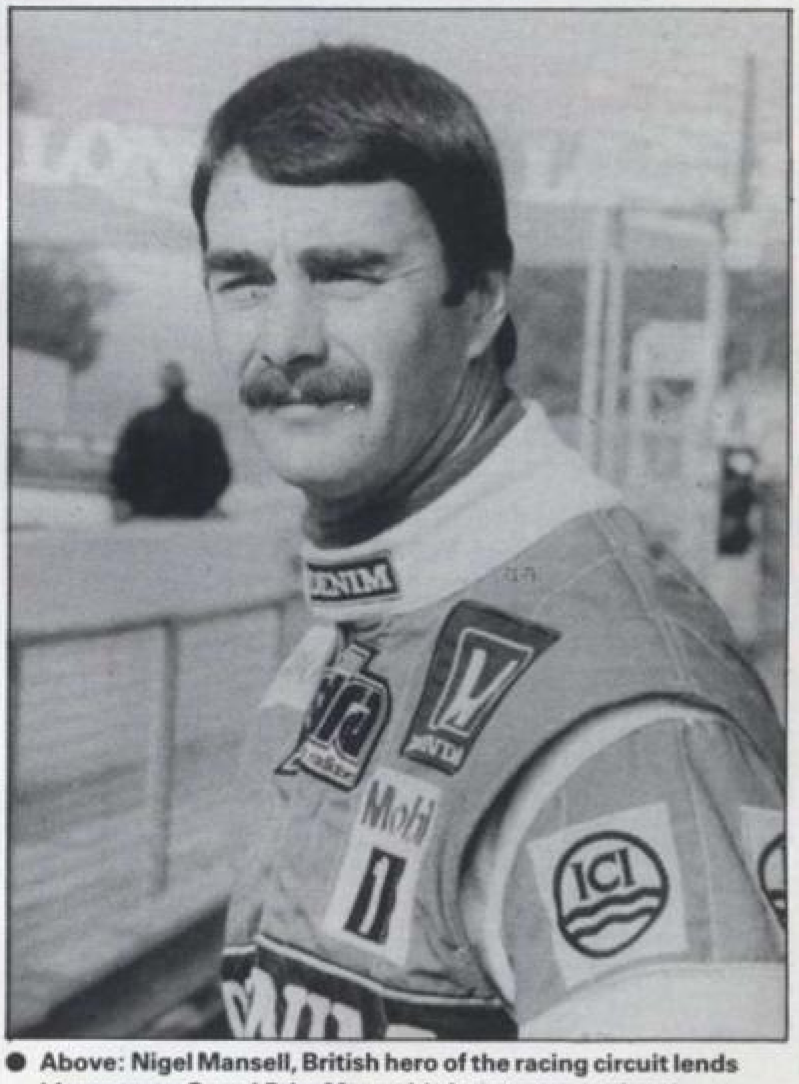
The machine is actually being sold through the Wildings office equipment chain, which has got an exclusive deal on the M24B. This beast is actually an M24 that was customised for the US market and which, for some strange reason, is in plentiful supply in the UK. Wildings' exclusive is based on the monitor casing being slightly different, but the guts are just the same.

The M24 itself isn't long for this world, as it's being replaced by the likes of the M28 and the new generation of Olivetti machines, but at £1300 it's still a deal worth looking at.

At last, the dBase Mac

The Macintosh will finally get its own version of Ashton-Tate's dBase at November's MacUser Show. Publisher Ashton-Tate originally announced dBase Mac last year, but knocked it on the head after beta test versions.

The new look dBase Mac supports 36 data files, which can be linked by dragging one file's key field to another, and can generate custom multi-field reports.



● **Above: Nigel Mansell, British hero of the racing circuit lends his name to Grand Prix, Martech's latest game release.**

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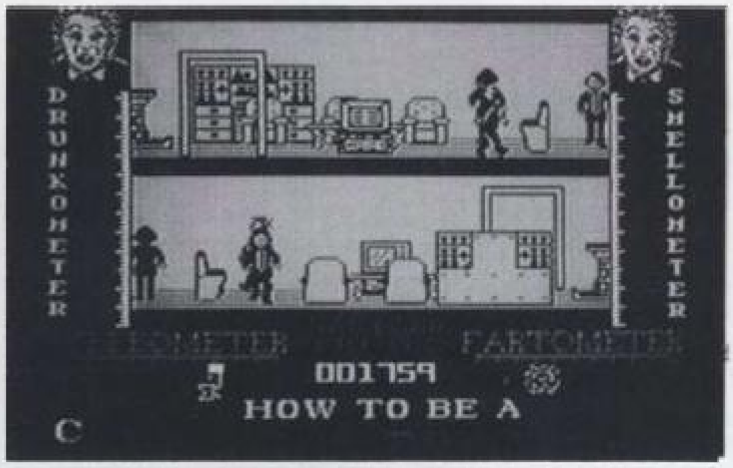
Above: Jeffrey Archer discusses his first game – Not a Penny More, Not a Penny Less with Domark

Wordstar reaches stage 5

Normally one-product companies have trouble following up the program that made them their money. MicroPro on the other hand seems to have trouble stopping. The latest word processor in the MicroPro stable is Wordstar 5, launched in the States this summer at $295.

The new version returns to basics by giving you the option of using old-style Wordstar commands rather than the pull-down menus introduced with Wordstar 2000, and according to MicroPro the program also incorporates over 100 'improvements'.

Wordstar 2000 has meanwhile been dropped, while the price of Wordstar, 2000 Plus has been cut to £465. Aside from playing happy families with Wordstar MicroPro is also planning an excursion into desktop publishing. The company's first package, codenamed Opus, is due for announcement later in the year, with UK shipments scheduled for mid-1988.



Virgin has at last confirmed rumours rife for many months that it is to start a non-games software label. Called "Virgin Software", its aim is to provide applications for the PC home-user which are as simple as possible.

The first release, to be previewed at the PCW show, is "Collectors Catalogue", a package intended for indexing, categorising, valuing and producing reports on all types of collections. Like all subsequent releases on the label, it will cost about £50. Five more titles are due in the near future, one of which is rumoured to be for maintaining investment portfolios.

Meanwhile, Virgin continues to release games at a rapid pace. In the kiddies department, a game based on a cartoon action series is currently being tied up with a view to cashing in on the Christmas market. An Atari ST version of Dan Dare is also coming out in the new year.

Consistent with the Virgin tendency to arrange tie-ins with other entertainment media, computerised versions of two well-known books are among its latest products. "How to be a Complete Bastard" is flush with the lavatorial humour one might expect of a Young Ones collaboration. The chain of destructive events at a yuppie party where the player has to earn as many bastard points as possible, will, Virgin hopes, be panned by guardians of the nation's morals and therefore sell extra copies because of its controversial nature.

Less contentious, but also of interest, is an IBM PC version of Shogun, the game based on the novel by James Clavell. It is to be followed by a couple of releases on the Leisure Genius label, a computerised version of Diplomacy for the PC and Commodore which will cost £24.95 and a reworking of yet another well-known game which is at present being kept under wraps.

The Handy Tandy

Tandy has celebrated its tenth birthday by launching the 80386-based model 4000, a $2500 laser printer and a $1500 PC compatible laptop. The latter is a direct competitor to the Toshiba T3100, generally regarded as the 'state of the art' in the laptop field, but on US prices at least it is substantially cheaper.

It has a built-in 3.5in. disk drive and full-size supertwist LCD. Tandy established itself as probably the most significant laptop manufacturer with the model 100, and later the model 200, but neither of these was PC compatible, and therefore companies like Toshiba and Zenith have been able to steal a march on Tandy. The new machine however means that the latter has by no means resigned itself to lose its earlier dominant position.

The 386 machine, the model 4000 basically follows on Compaq's approach to the new generation of machines rather than cloning IBM's PS/2. The technology to imitate Big Blue will be available, courtesy of Chips and Technologies, in the next few months.

Go for Gold

US Gold boss Geoff Brown has software labels like other people have meals (in more ways than one) but despite the abundance of allied labels already in existence he now has another – Go! The new label is intended to be 'high profile, high performance' and will kick off this autumn with six games.

These will include Trantor – the last Stormtrooper, an Ultima IV variant called Wizard Warz, Captain America, Bravestarr and Lazer Tag and Masters of the Universe. The games are intended for the Spectrum, Amstrad, Commodore 64 and Atari ST machines.

Amstrad launches PCW in Atlanta

Apparently Alan Sugar liked Atlanta. The PC 1640 was launched there in June, and this time round Amstrad has trotted out a revamped PCW, the 9512, at an office equipment show there. The strategy is high risk, as although the new machine looks much more like a 'proper' PC than its predecessors it still uses a 3in. disk drive, looked on by the US micro buying public with frank amazement, and uses the CP/M operating system. The latter was thought of here as out of date prior to the PCW 8256 launch, and the earlier failure of the PCW in the States means that the precursor to MSDOS has continued sinking slowly in the west.

So what Amstrad is trying to do with the 9512 is to break into the US market virtually from cold with a new standard. The new machine differs from the old in being fitted with Locoscript 2, an enhanced version of the old bundled word processor, and having a paper white monitor and daisywheel printer bundled with it. It costs $799 in the States, and will be launched here in September at £499. Price cuts on the 8256 and 8512 should follow.



Atari Challenges Amstrad

Amstrad isn't going to have things all its own way in the high streets this Christmas. Last year Commodore was in chaos and Amstrad, having bought the Sinclair range, had virtually no competition in the 'micro for Christmas' league. But this time round Atari is back in the frame.

Amstrad's current range consists of the Spectrum and CPC machines, but in terms of volume sales Alan Sugar will be looking to the Spectrum, priced at £149 for the Plus 2 and £249 for the Plus 3. Atari however has the XE games console, which with keyboard attached gives the Spectrum serious competition as an entry-level micro, while the 520STFM has had its price cut a further £100 to £299.

Put the 512K ST with built-in disk drive next to the 128K Spectrum Plus 3 with built-in disk drive and you start to see why the multiples have been looking to Atari rather than Amstrad for their Christmas big seller. At time of writing Amstrad was refusing to comment on price cuts, but look to the Plus 3 coming down by £199 by September.

Apple Marketing Board

August's Macworld show in Boston, Mass, saw the launch of a raft of new Mac products by Apple. Chief among these was Hypercard, referred to by Apple as 'fundamental system software'. Effectively it's an application development environment, to be bundled with every Mac sold. It uses a windowing system to allow users to customise data, extend programs and generally develop applications software without even knowing he's doing so.

Alongside this Apple showed Juggler were the multi-tasking version of the Mac operating system, a $600 fax/modem and an upgrade to the Apple Imagewriter, the Imagewriter LQ. The latter uses a 24 pin print head to print at 240 dots per inch.



Don't buy Amiga 500 warns Commodore

Commodore has taken the unusual step of warning UK users against buying discount Amiga 500s which have been imported without Commodore's knowledge. These, says Commodore, are being "made available by unauthorised dealers and distributors", and could be unreliable.

Commodore's main beef appears to be that they haven't undergone UK quality control, and that they will crack up at UK voltages. The machines are not however the US 110 volt standard (they'd certainly blow up if connected in the UK) but are 220 volt, which is reasonably close to our own 240 volt.

So the machines will actually work here, and they're liable to be cheaper than Commodore's official UK models. But there is a snag, if one of them goes wrong Commodore won't have anything to do with it, as the warranty offered refers only to the machine's country of origin.

letters

Looking after your pet dinosaur

I have recently come into possession of an 8 bit computing dinosaur, the Tatung Einstein. Do you or your readers know of a company that still makes software for this model? Is there a users club?

I would be glad to communicate with any of your readers similarly afflicted.

J. Ward,
27 Edith Road,
Canvey Island,
Essex SS8 0LP.

Editor's reply: Short of contacting the Natural History Museum, we have no information on how to track down this beast. Any readers who are better informed please write in and we will pass on your letters.

Script from the crypt

I'm looking to throw away some old copies of *Your Computer*. I have all copies of the magazine from Vol. 2, No. 3 (March '82) to Vol. 3, No. 10 (October '83) except for Vol. 3, No. 5.

Anybody out there want to make an offer? I also have the first two volumes of Popular Computing Weekly if anyone is interested.

Michael Shelley,
38 Beresford Gardens,
Hadleigh,
Benfleet,
Essex SS7 2SA.

Which PC?

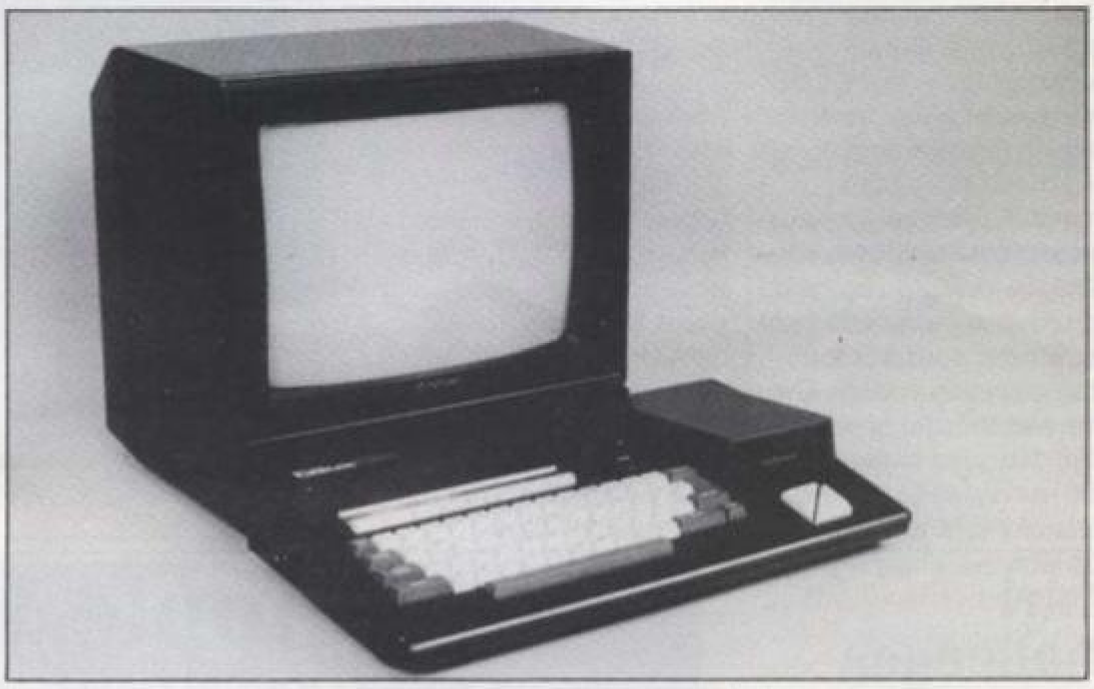
I would like to purchase a Personal Computer system but due to living in Spain I am having difficulty in obtaining information on available equipment.

I wish to use the system partly as an income earner and partly as an entertainment item. My requirements are that it produces advertising handbills which should have variable size characters and graphs, maps and pictures. It should also produce manuscripts for articles in magazines, carry out financial and investment management, play games such as chess and backgammon and possibly write software to be sold commercially.

My top price for the complete system is around £750-£800 exclusive of tax. What would you recommend?

G. D. King,
Alicante,
Spain.

Editor's reply: You could do worse than an Amstrad PC1512 which will give you everything you need at a reasonable price.



The right to reply

Dear Sir.

This is not a short letter however I hope that you will print it in your magazine as I feel you should at least allow your readers an unbiased view of your recent 'expose' on PBBS Adult.

My name is Mike Parker, the creator of this noticeboard, I was informed by my users of your recent article. This leads me to my first major complaint, surely a professional magazine such as yours should have the courtesy to discuss this article with me before publication. I have had absolutely no communication with Phil Rotsky or Ian Burley.

The format of your article starts off with cheap puns such as 'bawd' instead of 'baud' and even suggests pornography using terms such as 'grossly outraged'. Who do your members of staff think they are writing for? Is your magazine intending to become the News of the World (no offence intended NotW) or are you aiming to be the Mary Whitehouse brigade in computing?

Your article does have a considerable amount of errors which I think deserve being made clear:

I am the provider of the service however I do not run the noticeboard. The board is run by Sigops (Special Interest Group Operators). There are different sigops for the different areas the board caters for.

Your writers comment on the quality of the stories highlighting that these are not by 'proffesional' writers and as such the spelling and grammar are appaling. I would suggest that you look at the stories again, especially the ones by Sue Jones, the quality and style are excellent.

Your story expresses concern that Damien could get onto my service. This is my greatest concern, and I certainly accept your points, however as you say there are 'warnings everywhere'. If I knew of an easy way of finding out someones age without them loosing their anonymity I would happily adopt the method. My board is public access and therefore the only thing I can do is warn. Do you really consider there to be so much 'pornography' on this board, indeed anyone can see and read much worse by going into WH Smiths. You also say in your article that the 'messages were disappointingly tame'.

One point you certainly dont mention is the benefit the service has been to my many callers. I do not consider myself in anyway professionaly qualified, however have through the board helped many people who have had sexual problems get help and advice anonymously.

The board serves as a contact medium for both heterosexuals and homosexuals and as you say 'there are no reported incidents of anyone catching AIDS over the telephone'.

My service is absolutely free, I get no income from it. If I felt the board did not provide a much needed service I would stop it immediately. My only reward is the satisfaction of my callers. I suggest that Your Computer takes a similar adult attitude in understanding the purpose of the board and the service provided.

If PBBS offends anyone strongly enough then please contact me and I will certainly endeavour to resolve the matter. As I have said the service is for my callers, and as such I would stop it immediately if it was morally or legally wrong. The board is not out to corrupt, solicit or incite anyone, it is purely and simply an outlet for the frustrations that our civilisation creates.

Sincerely

Michael Parker.

Something to say about personal computing? Why not share it with other readers? Write to Readers' Letters, Your Computer, Greencoat House, Francis Street, London SW1P 1DG. Letters may be edited for length. Don't forget to include your name and full address.



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letters

Anti-Protext

I am not the type who usually writes to complain, mainly because I am lazy, but having written to Arnor Ltd. and received their reply, I feel I must air my views.

There were two reasons why I wrote to Arnor. The first was concerning a possible bug in their Protext word processor for the Amstrad CPC464. I told them that once the underline printing was turned on, it could not be turned off. I don't know if this was due to my Shinwa CP80 printer which, I believe, is Epson compatible.

My second reason for writing was that I wanted to upgrade my cassette version of Protext to a disk version.

This is the reply from Arnor: "Thank you for your letter dated 18th July 1987 regarding upgrading from cassette to disk. it will cost £14.00, which is based on the return of your cassette package."

They didn't mention the possible bug I asked about – they certainly told me the price of upgrading because it is obviously in their interest.

And what about the technical problems I faced? It seemed from their letter that they didn't want to know about it. This is in contrast to Hisoft who dealt with my technical problems over one of their products promptly and who are always happy to help their customers.

I bought my Protext cassette package for £17. The disk version is £23, a mere £5 difference. Who do they think I am, a millionaire? Charging £14 to swap a tape for a disk, I wonder how many people out there are willing to pay?

The letter stated "based on the return of your cassette package". Why so when the manual was written for both disk and tape versions? All that is needed is the return of the tape. Why must I send back the whole package when I will receive the same package back again except with a disk instead of a tape? Is this their excuse for charging £14 I'd love to know how they justify the price.

D. L. Lau,
Haywards Heath,
West Sussex.

Editor's reply: We passed Mr Lau's letter over to D.J. Fisk, managing director of Arnor. We publish his reply in full.

Mr Lau raises two points which should be answered separately. On the question of his technical query there is little defence I can offer. It is inexcusable not to reply to all questions raised in a correspondence and I can only say that this is an unusual oversight for us, as regular readers of the Amstrad press will testify, for we receive a number of glowing reports every month on the quality of our customer services. The only suggestion I can make for Mr Lau is to check the printer manual for the relevant codes for enlarged and underlined print as they cannot be an Epson standard.

On his second point, however, I have no qualms whatsoever in justifying a price tag of £14 for this upgrade service. The recommended retail price of each product is in fact £19.95 for cassette and £26.95 for disk, a difference of £7. Our handling charge for all upgrade services is a mere £7. This cost covers postage and packing, administration in three departments including quality control not to mention the cost of the item itself.

With the time and effort involved in upgrading I doubt if the operation shows a profit at all! Bear in mind one or two relevant items: we have a policy of constantly improving and upgrading our software and associated documentation. Old manuals are destroyed on receipt and new ones issued. Only the latest versions are issued which quite often contain many more features than the original which was sent in.

On the wider issue of upgrading, perhaps Mr Lau could tell me why we should offer a discount for upgrading at all? Sometimes the software returned is two years old! Why is it worth anything to us? If upgrading is an obligation then car manufacturers would be inundated with people wanting to exchange last year's model at a nominal figure for a new car!

Of course the answer is that Protext is so good that when people have tried it once they immediately want a "bigger" version; even Mr Lau described it as "a brilliant word processor". Like everything else in life, you get what you pay for.

D J Fisk
Managing Director
Arnor Limited

The Llama returns

I would be grateful if you could tell me whether the genlock hardware mentioned in the article about Jeff Minter in the August issue is available?

I am considering upgrading from MSX PX7 and the availability or not of genlock is crucial.

Incidentally: why no mention at all of the Philips 8280 MSX2, which would be ideal for this sort of purose if it did not seem to be unsupported even by its manufacturer!

Eric Fox
Canterbury
Kent

Editors reply: Contact Silica Shop on 01-309 1111 for information on Genlock. MSX-2 is not sold in this country.

MAN LOGIC

By NEIL BRADLEY



line noise

Communication

I can't help wondering how long it will be before we get the first case of online homicide. Of course, you can't actually kill someone with a micro and a modem, but there is often enough frustration involved with communications to drive the average, mild-mannered micro owner to murder.

That may seem like simple morbidity, but believe me, it's true. Having just taken the plunge by buying an Atari ST, and being the switched-on modern type who likes using electronic mail, I naturally had to acquire some comms software.

We'll get to the software in a minute. The point is that I should have had everything going for me – two excellent autodial modems and three comms packages. Nothing to worry about, I thought, I'll have this lot going in no time. And yet before I finally logged on successfully I had to spend several hours encouraging the part is of the system to talk to each other.

The problems I had getting anything to work are common to all programs, micros and human beings. That's why it's worth taking a look at the hassles, in case you're thinking of doing something equally adventurous.

I tried two modems. My main machine is a Pace Series 4, the V21/V22/V23 version. As well as offering all the really necessary speeds – only show-offs and wireheads use V22bis at the moment – the angled box and general styling make this the ultimate yuppie's modem. At best, they would if my Filofax didn't keep sliding off the top.

The other modem is the Tandata Tm602, offering the same speeds in a less exciting but more sensible box. Apart from the styling, the main difference between the two units is that the Pace is Hayes-compatible, whereas the Tandata goes its own sweet way. Therein lies the tale.

Most people choose their own modems, and given the right budget you'd be wise to opt for a Hayes compatible model. Most decent software which is recent and not written by a hermit will use Hayes protocols to do useful things like autodialling, autoanswering and all the other auto-fiddly-bits that are added these days.
Yet sometimes you can pick up a modem really cheaply second hand; at village fetes, Peruvian army surplus sales and from those odd shops that never sell any make you've ever heard of. The line here is usually something like: 'These were some of the best modems ever made. Can't think why they stopped doing 'em'. Or else it's: 'The Government's bought them all up. Terribly hush-hush. But I've managed to get hold of a few . . .'

None of this applies to the Tandata, which is a quality product, but not Hayes compatible. Yet it's still the sort of modem you might come across. There are times when you don't get a choice – at work, for example, where you may be handed the equipment and told to get it working.

The choice of software was better. I had Atari's own *Fastcom*, *K-Comm II* from Kuma, and *ST Datacom* from Aaronfay.

The Aaronfay product is by far the simplest. You can configure it to dial and log-on to databases selected from a menu, and there are the usual filing and frame grabbing facilities. It is easy for the novice communicator to use, but alongside the other two packages looks a little underpowered.

First impressions count,



1



2

and the Atari package scored well here. It comes with a decent ring-bound manual, and getting the software running is very simple.

The screen presentation is also very good. In addition to the obligatory drop-down menus the left side of the screen has a column of icons representing the more common functions, like the telephone book, text editor and so on.

A quick run through the program's features should give you an idea of the quality. Autodialling is offered, naturally. You get to choose from a number of modem types.

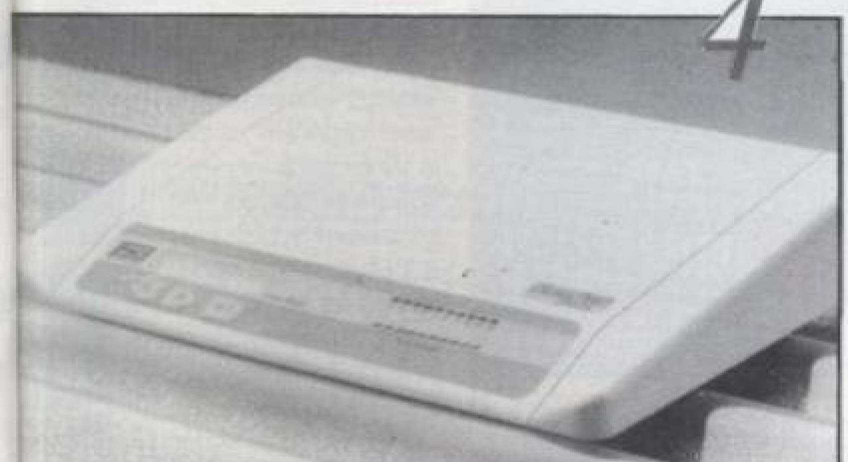
The phone book allows you to set up parameters for the most common systems you use. And the parameters can include a macro file containing a log-on sequence. This is created using the system's text editor – a fairly ordinary affair but good enough. One interesting goody is the call log. This keeps a record, in a text file, of which databases you called, the time, date and length of the call. The time and date will be correct only if you've set them at the start of the session, but it's a useful utility just for the duration information alone.

The software offers both scrolling and viewdata terminals. In the scrolling mode there are definable function keys and text spooling to disk.

The viewdata mode is even morte interesting. The Atari

news from Phil Rotsky and Ian Burley





doesn't naturally take to viewdata graphics, but the software solves this problem very imaginatively. In its default mode, you get black text on a white screen. Down the right side of the screen is a numeric keypad and selection boxes for things like moving to the next page or back to the previous one. You rarely have to use the keyboard.

Clicking the right mouse button switches screens. The control icons on the right disappear, and the viewdata page fills the screen – this time in full colour.

There is a third option, which is something of a compromise, and a pretty smart one at that. Using the two-colour screen, the viewdata colours can be represented as different text styles. For example, all text that would normally be green can be shown as italics, underlined, bold, outline or with a drop shadow.

1 *'The Tandata Tm602 . . . a less exciting but more sensible box'.*

2 *Fastcom, nearly the perfect modem software.*

3 *Fastcom is action on the Atari ST.*

4 *The Pace Series 4, the ultimate yuppie modem.*

Other features include a mailbox message editor and a clipboard which converts the viewdata screen to standard ASCII text. Full viewdata screens can be saved to disk.

In general, Fastcom is very easy to use. Full use is made of Gem, particularly in file transfer and similar operations.

The only thing I really dislike about Fastcom is that it needs to boot GDOS first. That means you can't simply insert the disk and double click on the program. It has to be started with a reset.

If Fastcom included a program for writing modem drivers, it would be the perfect software, and I wouldn't advise looking anywhere else. But you are stuck with the selection of modems supplied with the program – a list that didn't include the Tandata Tm602. So if you want to use anything but the standard range you'll need software a little more adaptable.

Here Kuma comes in, with K-Comm II. This is actually two comms packages in one. There are separate programs for scrolling and viewdata terminals.

The viewdata program is simpler than Fastcom, though it uses a similar system of text styles to represent colours. Alternatively you can get the full set of colours, in low resolution mode.

Similarly, the scrolling terminal is less sophisticated than Fastcom's. However, Kuma has included one feature which could make this program a life saver. You can define the program to work with virtually any modem.

Sensible people will have one of the better-known and more straightforward modems, in which case they can simply select it from the list. Those of us with a perverse streak have rather more work to do.

K-Comm II gives you a modem editor. You simply have to tell the program what commands your modem needs for things like dialling, initialising, speed setting and so on.

In theory, that means you can use the software with virtually any modem. There is just one proviso – that you know what commands the modem expects. The manual is probably not a bad place to start, but it's not that easy.

The Tandata Tm602 manual told me there are three ways to autodial. I tried all of them, with ignominous failure. In all I probably spent 90 minutes just trying to get the damn thing to dial. That's all, just dial.

Even the Pace modem gave me trouble. I was using it with Fastcom, but the most common problem was the modem switching online before it had finished dialling, something that had happened to me with BBC micro software. Eventually I largely solved the problem by adding a pause to the end of the telephone number. With Prestel it became two pauses. With Midland Homebanking I gave up using a log-on file altogether.

I still have the occasional problem the first time I use the modem each day. Hitting the reset button on the modem and trying again usually solves it, so it must be something to do with the initialisation or settings.

So there we have it – or at least, I do. Fastcom is the software I now use regularly, with the Pace modem and only the occasional hitch. But one day I'll work out the configuration and finally get to grips with the Tandata.

line noise

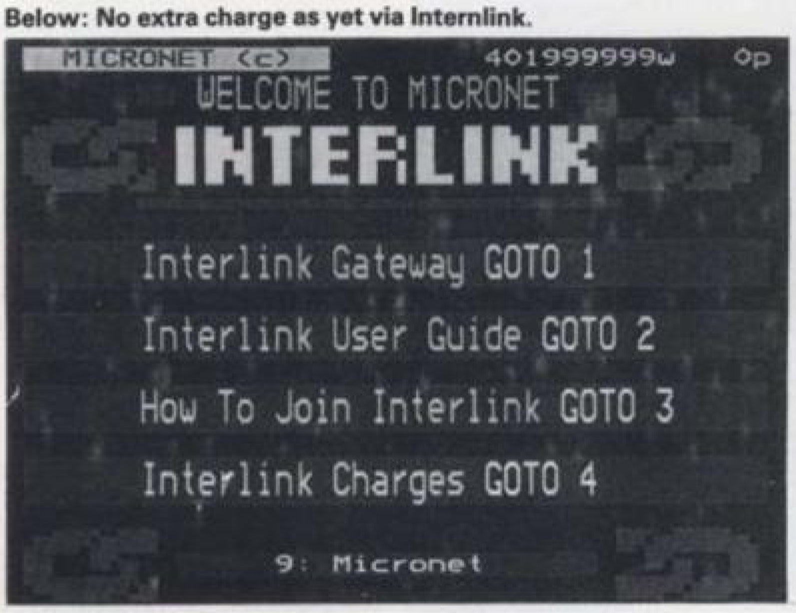
Let your PC do the dialling

A new telephone number director/dialler program for IBM PCs and compatibles has been announced by PC Communications. The program, Demon Dialler, is designed to work with PC Comms' own Breakout and Quattrocard modems but can read files generated by other dial-up programs too.

Demon Dialler costs £28.75 including VAT and is now bundled with the popular Crosstalk XVI comms package. Demon Dialler will also be supplied free with the previously unbundled Quattrocard modem.



Above: The Breakout modem from PC comms now has a director/dialler program to run with it called Demon Dialler.
Below: No extra charge as yet via Internlink.



Telecom Gold revises charges

BT Gold has made radical changes to its tariff structures. Depending on how you use the service, there is both good and bad news. The connect time charge has been substantially reduced for example. The standard rate, 8am to 7pm Monday to Friday, used to be 11p per minute but will now be just 6.5p per minute. Cheap rate connections will now cost 2p per minute as opposed to 3.5p per minute previously, so it would appear that anyone remaining online for long periods should benefit.

However there is now a brand new 'transmission' charge. This means you will be charged 4p for every 512 characters passed to or from your terminal during standard rate time. However the first 512 characters will be free and the cheap rate charge is only 1p per 512 character block. Part blocks will be rounded up.

The charge for using the Infocheck database on Gold will now be £3.00 per minute against £2.50 previously. Perhaps most controversial of all is the imposition of another new charge, a £5 per month subscription fee. A fiver a month doesn't sound much but adds up to a significant £60 a year. Luckily, Micronet users on Prestel who use BT Gold via the Interlink gateway will not be charged the extra £5 per month as they already pay a subscription (to Prestel).

Overall, it has been calculated by some regular users of Telecom Gold that the tariff revisions will amount to increased costs for the user, especially with the extra £5.00 a month subscription.

Hacking convictions quashed

Robert Schifreen and Steve Gold, convicted of hacking into Prestel under the terms of the Counterfeit and Forgery Act one year ago, have successfully appealed against the prosecution (by British Telecom) in the High Court and BT has since been refused leave to appeal to a higher court.

The case against Robert Schifreen (a staff writer on Personal Computer World magazine) and Steve Gold (freelance journalist and editor of Micromouse on Micronet) was unreservedly thrown out by the five Appeal Court judges, headed by Lord Chief Justice Lane.

The judge referred to the prosecution's use of the Counterfeit and Forgery Act as "wholly inappropriate" and accused them of attempting to force the language of their case to fit the terms of the Act. It appears that BT tried to convince the original jury (successfully) that Schifreen and Gold had broken into Prestel by forging a false instrument. In simple terms this might be analagous to making a key to fit a lock or in this day and age perhaps making a false cash dispenser card to gain access to a cash machine.

The prosecution failed to convince Lord Justice Lane, or his colleagues, that any such forged instrument had been used, or had ever existed in the case before them. BT vainly described the 'instrument' as being a Prestel 'user segment', a data buffer in three parts where one's customer identity and password (which are both supposed to be secret) are stored for an instant before being processed either to let in the user or to bar access to the Prestel computer.

It almost seemed as simple as this; the proposed forged instrument could not be visualised, nor picked up and physically handled like, say, a cash dispenser card, there was no such forged instrument – case thrown out. Perhaps it's lucky for Steve Gold and Robert Schifreen that you don't need to plug an ID card into a modem to log on to Prestel . . .

Lord Justice Lane recommended that if the prosecution thought the law lacking in its powers to deal with hackers, it should lobby for new legislation. He reminded everyone that he did not wish to see any further attempts at using laws inappropriately. Many who commented on the case from the start had wondered why BT chose to use a criminal

charge against the two hackers, especially as there was really no suitable law to handle the case. Of course this was a test case for BT and therefore a calculated risk on its part, but a prosecution based on a lesser, civil offence charge, would probably have had more success.

As we went to press, however, the Schifreen/Gold case hadn't quite been laid to rest as the news is that BT is considering an alternative appeal to the House of Lords.

Demon Designer

The Demon Modem (née Unicom) was a revolutionary device. It offered a remarkable range of functions (300 and 1200/75 baud in either direction, auto answer, baud rate detect, etc.) and was supplied with some innovatory software for the Beeb in the form of the ZRomm from Jez San's Argonaut software. All this came for well below £100 and set the ball rolling for budget modems – even though it never gained BT approval.

Dataphone Ltd, who took the Demon under its wing some time ago, has now announced two new Demons – the Demon II and the Designer Modem. What's more, BABT approval has been sought for both! The new modems are basically tidied up versions of the original Demon with some extra features such as a call monitor and internal power supply. The Designer version also has a full manual override capability.

The original Demon had a DIN plug Beeb serial connector only, but the new Demons will work happily with most micros courtesy of a standard D connector. Dataphone is targetting the new modems at Amstrads and PCs as well as Beebs.

The Designer Modem costs £99.95 excl. VAT, complete with a free RS232 lead until BABT approval is confirmed.

Prestel Improves Telex Link

Prestel's online telex service, Telex Link, has been modernised to take advantage of BT's new SPC (Stored Program Control) telex network – a bit like System X for telexes with digital exchanges. A new Telematic 500 minicomputer has been installed and this will help Telex Link to process more telexes per hour than before and improve monitoring of any messages that might not be delivered successfully.

A totally new Telex Link database can now be found on page 797 and keyword search has been introduced to help speed up access to facilities and information which was previously only available through loads of menus. One thing to remember is that with the advent of the new SPC telex exchange, the Telex Link mailbox number has been changed. The new number is 934999 TXLINK G, though the old number will remain active for a couple of months in the interim.

Microlink Typesetting

Microlink has teamed up with type-setters Wordstream to enable specially prepared text files to be received at Wordstream via email, to be processed and type-set almost entirely automatically on a quality linotype laser printer. Finished work is then either posted back to the sender or couriered.

155 type faces are offered as well as a whole range of special effects. Finished proofs cost around £3.00 a sheet according to quantity. All the sender needs to do is prepare the text to be type-set by inserting special word processor-like embedded effects commands, a list of which is supplied by Wordstream on registration. The service is only available to Microlink Members on Gold.

PCW SHOW PREVIEW

THIS YEARS SHOW SOUNDS MORE EXCITING THAN IN FORMER YEARS. WE PREVIEW THE EVENT.



This September sees the tenth anniversary of the Personal Computer World Show which, from lowly beginnings, has grown into an umbrella showcase (Compec has meanwhile grown into a hatstand) for everyone from budget software house to business micro supplier.

The show will be following the format of recent years by splitting into business and home sections, with the former promising yet another wave of **386 PC** launches and the latter making its annual contribution to the video production industry. The business section will include an entire level devoted to "PC Productivity". This is to be sponsored by PC magazine, Britain's second biggest magazine for the corporate PC user, and will house experts on desktop publishing, online information, artificial intelligence and networking.

Mugs of the show will be the editors and staff of Desktop Publisher, whatever that is, who will be printing a special show issue – we'll lay you odds they use something they "prepared a little earlier". Other attractions will be the **Association of Information Management,** which apparently aids librarians, the Open University, which will tell you all about expert systems, and naked mud wrestling. No, sorry, the naked mud wrestling's cancelled.

There will also be a Budget Software Village, which will offer free software consultancy along with hands on experience. Keith Prowse Journeys and Thai Airways will be combining to make the charms of level 2 even more irresistible. The two will be running a free draw for a holiday for two in Thailand. Those of you who think neither has any direct connection with micros have no doubt forgotten the coup in Thailand some years back, when a number of Thai generals, guests of Ericsson Information Systems, were finally tracked down by their panic-stricken subordinates in a Stockholm bordello . . .

As far as the actual exhibitors go this year the As have it, with **Amstrad** and **Atari** being joined by an Archimedes-toting **Acorn** at the top end of the excitement stakes. Amstrad could do anything – the company has booked one of the largest stands at the show and prior to the opening was maintaining that it would be showing machines in four categories – games (Spectrum and CPC), word processing (the PCW machines, this time joined by the PCW 9512, which sports LocoScript 2, a daisywheel printer and more conventional PC looks), the PC1512 and 1540, and printers. The company does however have several other projects on the stocks, including an 80386 machine, laser printers and a desktop publishing package. These almost certainly won't be unveiled for PCW, but don't bet on it.

Atari plans will be even more flexible than


PRIVATE
VIEW

Amstrad's – at the 1986 show the company made a belated decision to announce the Mega STs on the third day of the show, and this year Atari will again be organising an Atari "village" with 30 supporting software houses present. The "entire range" of machines will be there, including, PCs, STs, XEs and games consoles, and Jack Tramiel (who will also be at the show) is hinting at more surprises.

Part of the backup will come from **Frontier Software,** which is importing **Supra's** ST hard drives. These are claimed to be smaller and faster than Atari's own, and come in 20, 30 and 60Mb flavours.

Just a shade downmarket is budget software house **Anco,** which intends to roll our £9.95 games for the ST and the Amiga. **Cheetah,** another contented in the small but perfectly formed stakes, will be launching the Powerplay joystick for PC compatibles. (Hasn't somebody already done that?).

After years in an apparent catatonic trance, Acorn is to follow up the launch of Archimedes, its super-fast Risc machine, with Springboard, a PC add-on card for Archimedes. Alongside this the company will be showing AWriter, View Professional and Logistix for the machine.

Great ideas front: when **IBM** launched its 80286 AT some years back it gave it 1.2MB drives that weren't compatible with the earlier 360K variety. **Computer Frontier's** A286 portable, launched at the recent PC User show, has a dual speed drive that will handle both, alongside a 20MB hard disk and a price that rivals everyone's favourite portable, the **Toshiba 3100.**

Over at the coalface of the games industry **Activision** will be showing its new super-intellectual stance with a game licensed from Predator, Arnold Schwarzenegger's most recent cultural contribution. Supersprint, Rampage and Firetrap will be providing backup.

Amstrad leftover **Sir Clive S*ncla*r** is currently promising backup for his Z88 portable computer in the shape of RAMpacks and Eproms, plus software that will allow the beast to read Wordstar and Lotus files. Our spies noted with some amusement that his company's submission to the show organisers had "with apologies for lateness" scribbled on it . . .

Commodore, which last year contrived to launch its Christmas games machine, the 64c, in the business hall, is this year following Atari's "village" concept. The "hand picked" villagers will be showing lots of hardware and software backup for the Amiga, and this will include some desktop publishing systems. It probably will not include a price cut on the Amiga 500.

Back with games software **Domark** will be producing something for anyone who doesn't know whether to watch the box or plug in the Spectrum. The TV Games range will be based on the likes of Treasure Hunt, Blockbusters and the Krypton Factor. Durell will respond with two that we guarantee will never get to the top of the games charts – Insurance Master version 2 and Investment Manager. Wasn't this outfit a lot more frivolous this time last year?

Another old-stager that has changed horses is **ELR,** once known as **East London Robotics,** which is now putting out the Isis PC compatible. Sinclair veterans might like to go up to the stand and try to buy a copy of ZX Slowloader . . .

One company that has stuck with it is air combat simulation specialist **Digital Integration,** which is launching – yes, you've guessed it, two air combat simulations.

Coin-op conversion specialist **Elite** is meanwhile launching two coin-op conversions, Ikari Warriors and Buggy Boy, while **Hewson** is launching another one. More plausibly it will also be trotting out the follow-up to Quazatron, Magnatron. **Konami,** which has converted itself from coin-op, will have Jackal and Iron Horse (could this be an X-rated version of Southern Belle?) on display.

One of the bigger software stories however will be **Electronic Arts,** the highly regarded US software house that will be launching itself and 20 titles on the UK at the show. EA is hoping to follow the success of **Microprose** here, and with hits like Skyfox and Marble Madness in its locker it stands a good chance.

Meanwhile **Microprose** will have Project Stealth Fighter, based on an aircraft that is so secret the designers can just make up anything they like, and its sidekick **Origins** will have Ogre, a fantasy game that is already wowing America. A word of warning about the MicroProse stand. Keep clear if you see a clean-cut American who looks like an ex-fighter pilot, otherwise Wild Bill Stealey (for it is he) will have you into the MicroProse flight simulator before you can say "airsick".

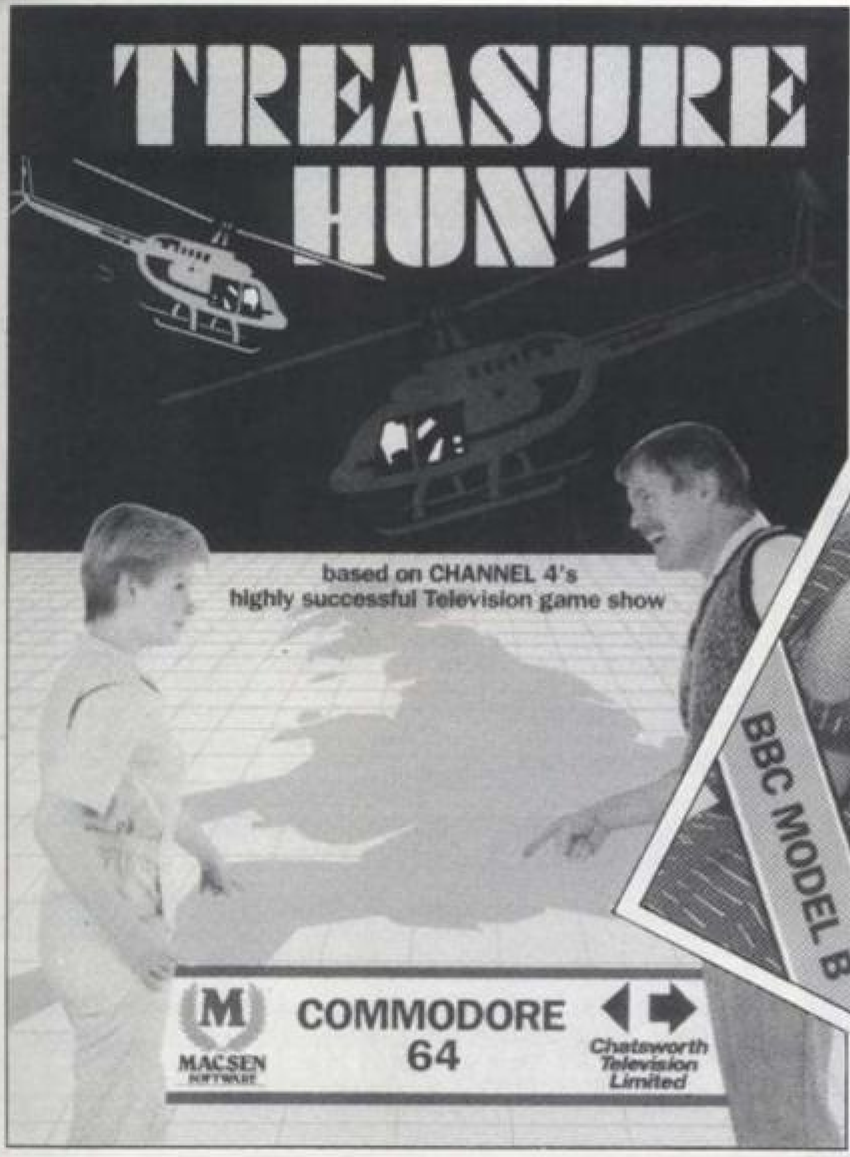
Typo time: Jeff Minter, **Llamasoft's** answer to Jerry Garcia, claims to be putting out Returned (sic) of the Mutant Camels. He's not trying to sell software that wouldn't load is he?

Mirrorsoft will be adding yet another company to its stable at the show, but recent moves by its ultimate boss, Robert Maxwell, mean that the launch of London Daily Newssoft is almost certainly off. It will however be a US company, almost certainly one involved in 16-bit software.

Spectrum Holbyte, which is already owned by Maxwell, will be showing off Fighting Falcon and PT109 (one year early for the 25th anniversary of John F. Kennedy's death, but see Star Trek, below). PSS, which Maxwell also bought earlier this year, will have Fortress America on display as a follow-up to Theatre Europe. Still a few continents to go, but Camp Africa, Asian Attack and Invasion Australia all sound a bit improbable . . .

Firebird will be following the coin-op trend with Flying Shark and Bubble Bobble (did you know there's a little Japanese fellow who gets $250,000 a year for making these names up?). Its parent company BT Telecomsoft, has long experience of putting coin into slots, as its five year mission to bring Star Trek on to the market shows. But wait – Star Trek is really being launched at PCW. All they need now to come out evens is for it to go to the top of the charts and stay there till the turn of the century . . .

On the subject of chart-toppers, Firebird is trailing "good news" for Elite fans. No details as yet, but we'd guess the old project to convert it for the ST has been dusted off. Atari incidentally first promised an Elite-like game for the ST in 1985 . . .



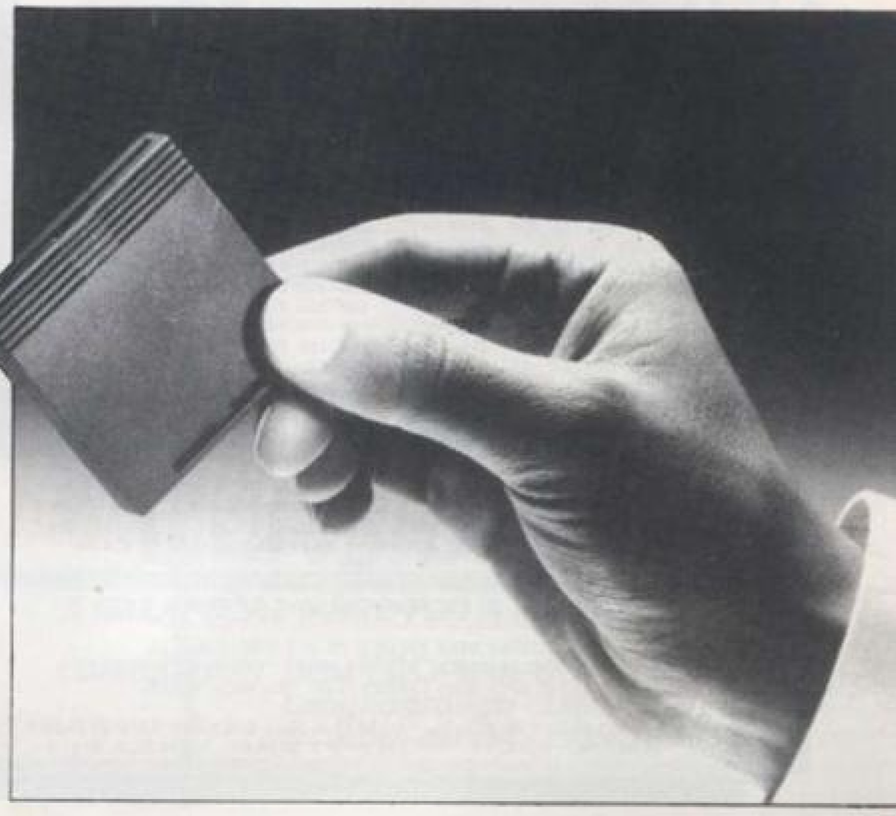
● New games galore will be on show.





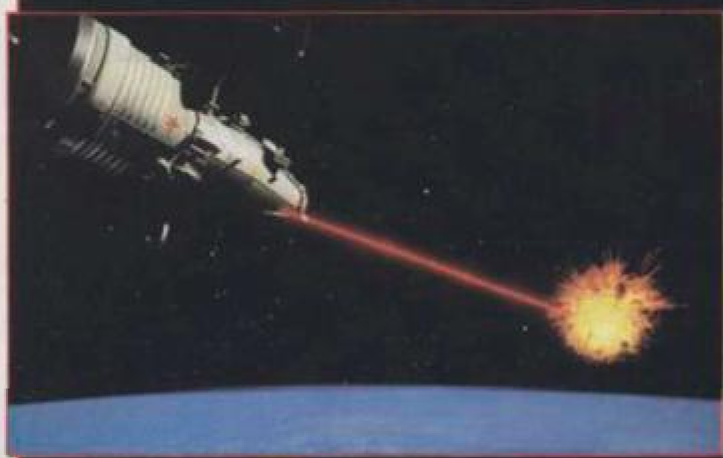
● The event has a serious side too.





COMPUTERS

CONFL



NEW TECHNOLOGIES WILL EMERGE FROM THE STAR WARS PROGRAM FRANCIS BOLTO ASKS WHAT CHANGES WE CAN EXPECT TO SEE

With Star Wars now almost set in motion by a more than determined American President, the computer-using fraternity must be pondering the implications of such a colossal research and development initiative – a program which must surely give rise to new computer-associated technologies and possibly programming techniques, be they residual or otherwise. We are all aware of the enormous impact the Apollo Moon Program had and the microcircuit technology which emerged but apart from being widely-publicised, the Apollo Moon Program set the proverbial ball rolling in many other quarters of today's high technology.

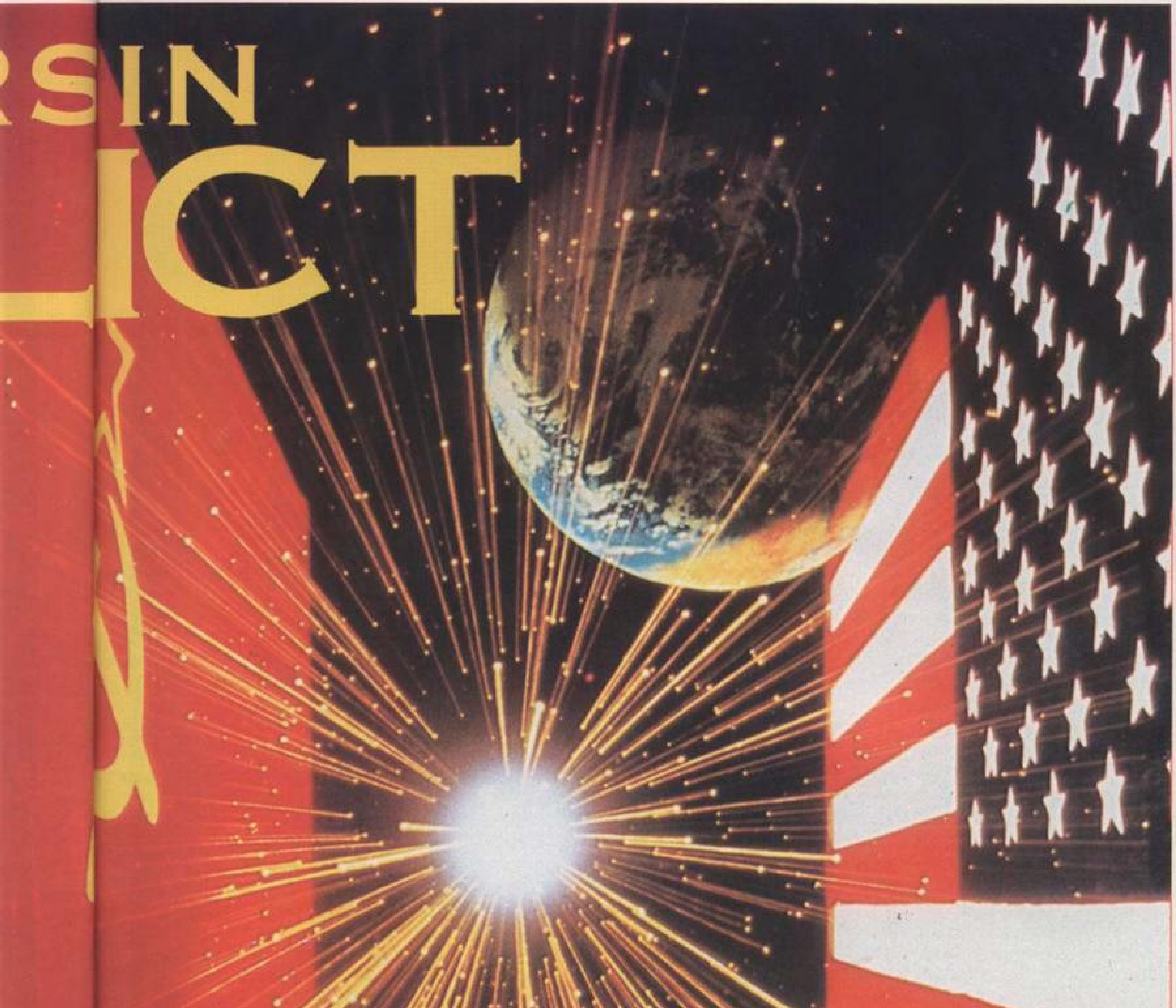
So what emerging technologies can we expect to emerge from Star Wars and, perhaps of more significance, can we look back through what seems like a millenium to the Apollo Moon Program and draw parallels? If so, does it give us any insight into what the computer-orientated developments might be?

Since those early days of the 1940s, when the valve formed the main constituent of a computer, scarcely a decade has passed without technological change which could be regarded as less than revolutionary. It seems the computer today has materialised from a brisk and contemporary history, lacking only in direction. Off-shoots have been the stuff which made computers. The whole of the microcomputer explosion emanated from the initiative of President Kennedy saying, "by the end of the decade we will put a man on the moon". That resulted in the generally-accepted birth of microelectronics and a number of applications which at the time must have seemed destined for use in research and development establishments.

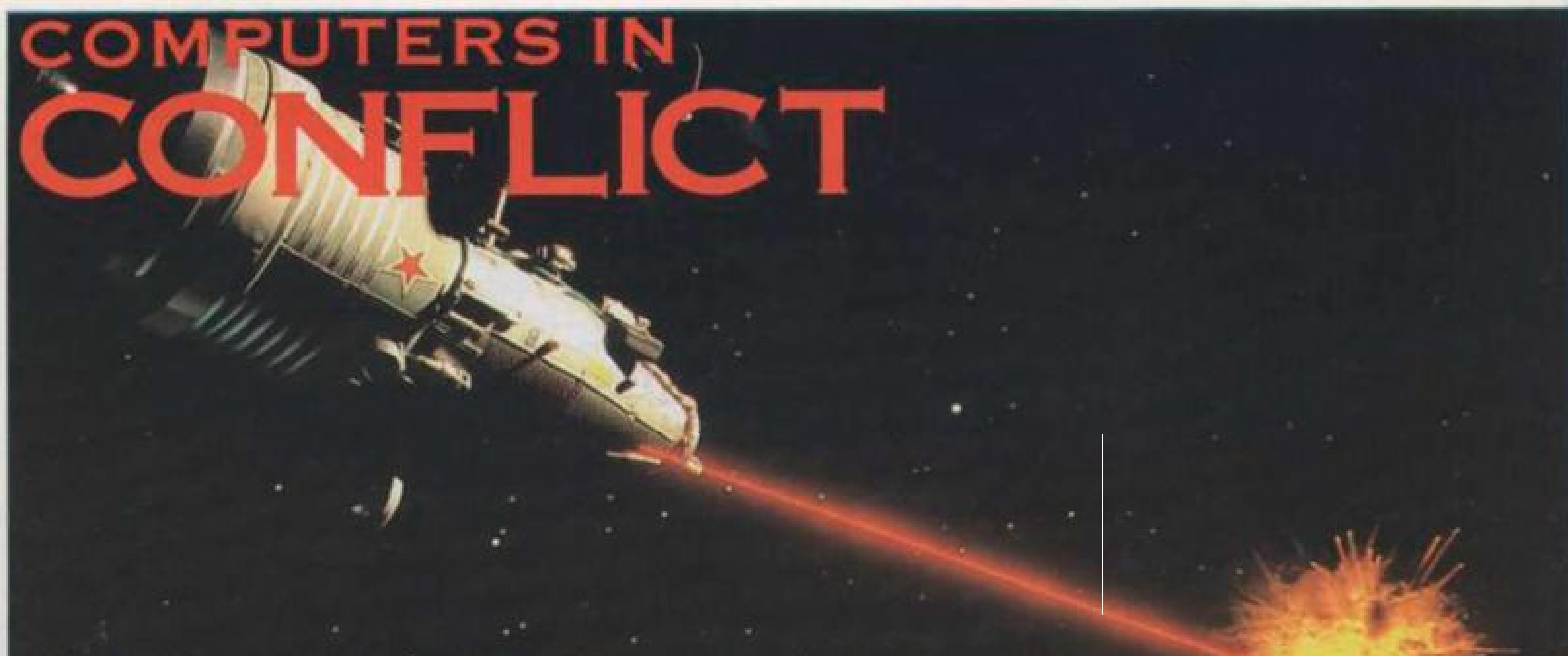
One such application which could be attributed to the Apollo Moon Program or its termination is CAD. In the States, the CAD industry, like much of today's high technology, emerged largely as a result of research and development by military, aerospace and sometimes industrial quarters. So detached was its development that the method in which it interacted is largely unexplained.

The lightpen can be credited to the Sage program implemented in the mid-1960s and was concerned with the development of an early warning radar system. Naturally such a manually familiar form of user-communication was a great advancement in the development of CAD. Together with the refresh graphics screen developed by Tektronix, it could be described as perhaps being the birth of interactive computer graphics.

For several years to follow, CAD began to receive more and more attention, and the automotive industry, namely General Motors, conducted its own research. A vitally important program then materialised in the early 1970s, the ICAM program concerned with the standardisation of CAD-related software and systems, contrived to promote interchangeability and rationalisation.


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COMPUTERS IN CONFLICT



The real impetus for the CAD industry followed when the Apollo Moon Program at the NASA centre in Huntsville, Alabama was wound down. It left many of leading American computer programmers and technologists to migrate to nearby Intergraph, a company which had frequently carried-out contract work for the NASA centre and were pleased to recruit such personnel at a time when there was dire shortage of computer expertise.

In the aftermath of the Apollo Moon Program, all kinds of other computer applications became widespread, due mainly to the microcomputers of the late 1970s. Before the epoch of the space race, the only desk-top computers were minis; built largely around the painstakingly discrete transistor, they were inherently unreliable. Things were soon to change with the emergence of minis dependent on gates and flip-flops in the form of fairly discrete small scale integration circuits. Then followed medium scale integration circuits accommodating hundreds of devices per chip. Finally, in 1971 the microprocessor emerged, albeit a 4-bit one, but it paved the way for Intel and Zilog.

Today, the computer world as a prologue is very different from that of before the space race. Now we have inexpensive and powerful microprocessors and, of late, a relatively affordable single-chip micro in the form of the Inmos transputer. Though these devices and present technology could be vastly improved, will it really be necessary to enhance them, perhaps by developing even more advanced chip manufacturing processes? Will it even be necessary to turn from the ubiquitous silicon wafer and utilise faster semiconductor materials like gallium arsenide?

So will the protective umbrella which will shield the United States from nuclear attack be controlled by computers? In Star Wars, the argument for the further development of microcircuit technology might be met with something like this. In any computer or control system, the processors can be as fast as you like but if communication between processors, peripherals, processes under control, transmitters, servos, and so on is of anything less than a complementary speed, the speed of the whole system will be governed largely by communication speed only.

We must not forget that, theoretically, Star Wars is to respond automatically if provoked by attack and with a number of batteries of lasers floating far apart and high above the earth, communication speed must form a pinnacle of concern. So it is almost certain we can expect development in the area of lightwave communications via fibre optic cable but, perhaps more significant, as much of Star Wars control and communication will take place out of the earth's atmosphere, free-space lightwave communication must represent a feasible technique.

The progress made in that area will perhaps contribute to the already-contemplated possibility of constructing computers entirely based on optronic devices, where the singular world of the electron within today's computers would gladly be exchanged for the altogether more concurrent property of light. Such an advancement would be perhaps comparable to the step from copper wires to fibre optic cable. To be realistic, Star Wars will offer nothing but the most basic technology towards what now seems a very science fiction type notion.

Since the space race, practical lightwave communication via fibre optic cable perhaps represents a significant breakthrough in the long term for computer technology. It is perhaps strange to imagine that the idea of lightwave communication is not nearly contemporary, as its conception was contrived many years ago by Alexandra Graham Bell, who was mocked for his innovation. An editorial in the August 30, 1880 copy of the *New York Times* described Professor Bell as an individual "who invented a great deal of the telephone" and then suggested Bell would perhaps "hang sunbeams from telegraph poles". Unknown to this anonymous writer, the nail had been hit on the proverbial head.

Returning to our period in computer history, lightwave communication can be attributed to two main milestones, the first being the invention of the laser in the 1950s, and the second in 1979 with the development of fibre-optic cable imposing what is thought to be a minimum loss – the cable was manufactured in its purest form by the Japanese Nippon Telegraph and Telephone Co.

With regard to programming, it is almost certain that this time there will be far more dependence on concurrent programming languages, as it seems only they can offer maximum processing power per pound of computer hardware. As for which concurrent language(s) will be used, Modula-2 and Ada seem to be dated now, and if transputer technology is to be utilised, Occam will play a role no doubt. Such speculation naturally assumes that the boffins in charge are considering the same leading-edge, commercially-available languages as us but that may not be the case.

It has not gone unnoticed that many observers are swayed by emotive thoughts rather than sound technical or scientific reasoning. We are not participating entirely in guess-work when we say that Star Wars will contribute significantly to the advancement of lightwave communication and optronics. Who knows, a new concurrent language might even emerge from the research.

FRONT DESK

Erratum

Pam Durkie of Tandata has pointed out to us a small slip in our August review of the Tandata V22/V22bis modem, the Tm722. We quoted the price as £399.00. It is in fact £499.00. Close but no cigar. Our apologies to Tandata and anyone who thought they were about to buy a V22bis modem for under £400.

Logotron is all set to be a massive success.

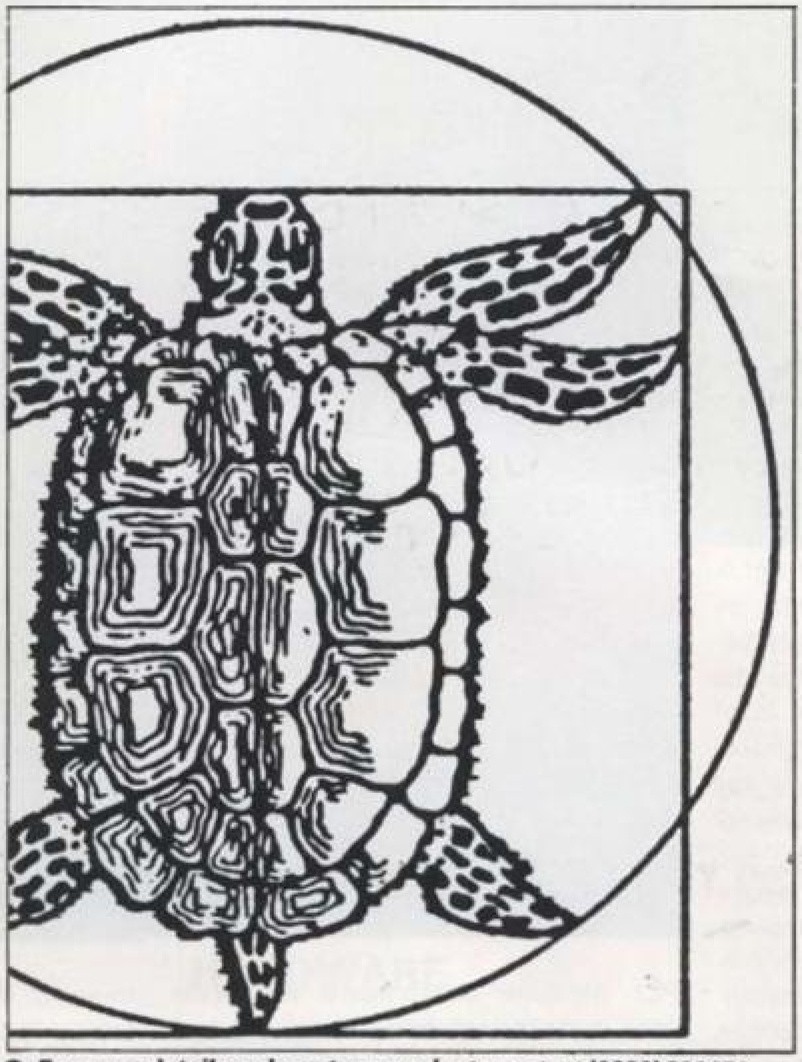
One of the biggest hits at the PCW Show is likely to be ten 1295 Series of software from Logotron Business Products. It consists of three different packages – a database, a spreadsheet and a word processor – costing only £12.95 each.

The products first appeared in the United States where they sold very well under the Spinnaker label. Part of the reason they are so cheap is that they only have about 70 per cent of the features and capacity found in their more expensive counterparts – but who ever used all the facilities Wordstar has to offer anyway?

The programs are designed to be idiot-proof and feature on-screen help menus with supplementary pull-down menus instead of a manual. Each of the three uses the same command structure and they are all integratable, allowing exchange of information from one to another for purposes such as mailmerging. To stress the integrated nature of the three programs, Logotron is offering them in a three in one version for £29.95, a fraction of the cost of most integrated packages. All three run on both the Commodore and PC compatibles.

Logotron Planner 1295 is the spreadsheet; it can provide 50,000 individual cell locations. The WP package, **Logotron Writer 1295,** supports enhanced printing such as bold and underline facilities and features a 100,000 word spelling checker. **Logotron Filer** 1295 is a database which stores up to 10,000 separate records with a maximum capacity of 25 characters in each field.

The series will be much in evidence next year when it is bundled with the new low-cost Olivetti PC-1 (see review). Logotron will also be introducing a larger integrated package from Spinnaker in 1988. It is likely to be called **Eight in One** and will cost about £50.



● For more details on Logotron products contact (0223) 323656



Word Up



Kuma has launched a Gem based thesaurus for the Atari ST called K-Roget. Costing £49.95, it includes over 150,000 words and phrases. It includes a backtracking facility which enables users to retrace previous searches.

THE ITALIA

THE OLIVETTI PC1 WILL ARRIVE HERE NEXT YEAR. SIMON CRAVEN GIVES US A SNEAK PREVIEW



Olivetti has announced an innovative IBM-compatible computer which it hopes will open up European and American consumer markets. Hitherto the company has sold mainly to business users.

Now going on sale in Italy at a price equivalent to US $600, the PC1 combines full PC functionality with an appearance more in tune with the home.

The PC1 runs a 8Mhz NEC V40 central processor which emulates the Intel 8088. This is the same clock rate used by almost all respectable PC manufacturers, running as it does almost twice as fast as the original IBM PC. In case the higher speed causes timing problems with finicky software the machine can be slowed to a pedestrian 4.77 MHz, but it is extremely rare for this to be necessary. Memory capacity is 512K as standard, with an optional upgrade to 640K. Disk drives are similar to those used by the new IBM PS2 range and an increasing number of IBM-compatible portable and desktop machines. One of the 720K 3 ½ inch units is fitted as standard, but a second can easily be fitted by the owner.

We managed to track down a pre-production prototype of the PC1 – the only example in the country at present – with Logotron, a software house in Cambridge specialising in educational and artificial intelligence software.

COMPACT

The first surprise was the compact size of the computer. Despite descriptions by Logotron's Anil Malhotra we were not ready for a fully-featured PC little bigger than most home computers, or indeed one of Olivetti's own portable typewriters.

Except for those with aspirations towards portability, IBM-compatible personal computers are configured in three boxes: the computer containing the disk drives, the monitor and the keyboard. The PC1 breaches this protocol by incorporating the keyboard, computer and disk drives into the same small unit, more like an Atari ST or other home computer.

The keyboard is based on the early IBM PC type, but to limit the width of the machine the ten function keys are arranged across the top instead of forming two vertical rows to the left of the typing area. The key feel is as light and positive as you would expect from a company with as much experience of electric typewriter manufacture as Olivetti.

DISPLAY

Display options are the familiar CGA (colour graphics adaptor) fitted to the basic model, with the option of the increasingly popular EGA (enhanced graphics adaptor). This is a factory-fit option as the compact dimensions of the PC1 preclude conventional expansion slots inside the machine, though one bus connector is available to equipment which can live outside the case. Sadly, the high-resolution monochrome text display mode of the Olivetti M24 is absent from the new machine, so the 80-column text display of the standard model is that produced by the CGA. This can be tiring to the viewer over long working periods, and the much sharper EGA is greatly to be preferred even for such non-graphical applications as word processing.

Around the back of the case are standard ports for RS-232 interface, parallel printer output and video. No UHF modulator is fitted for use with a domestic television. A joystick/mouse port is standard.

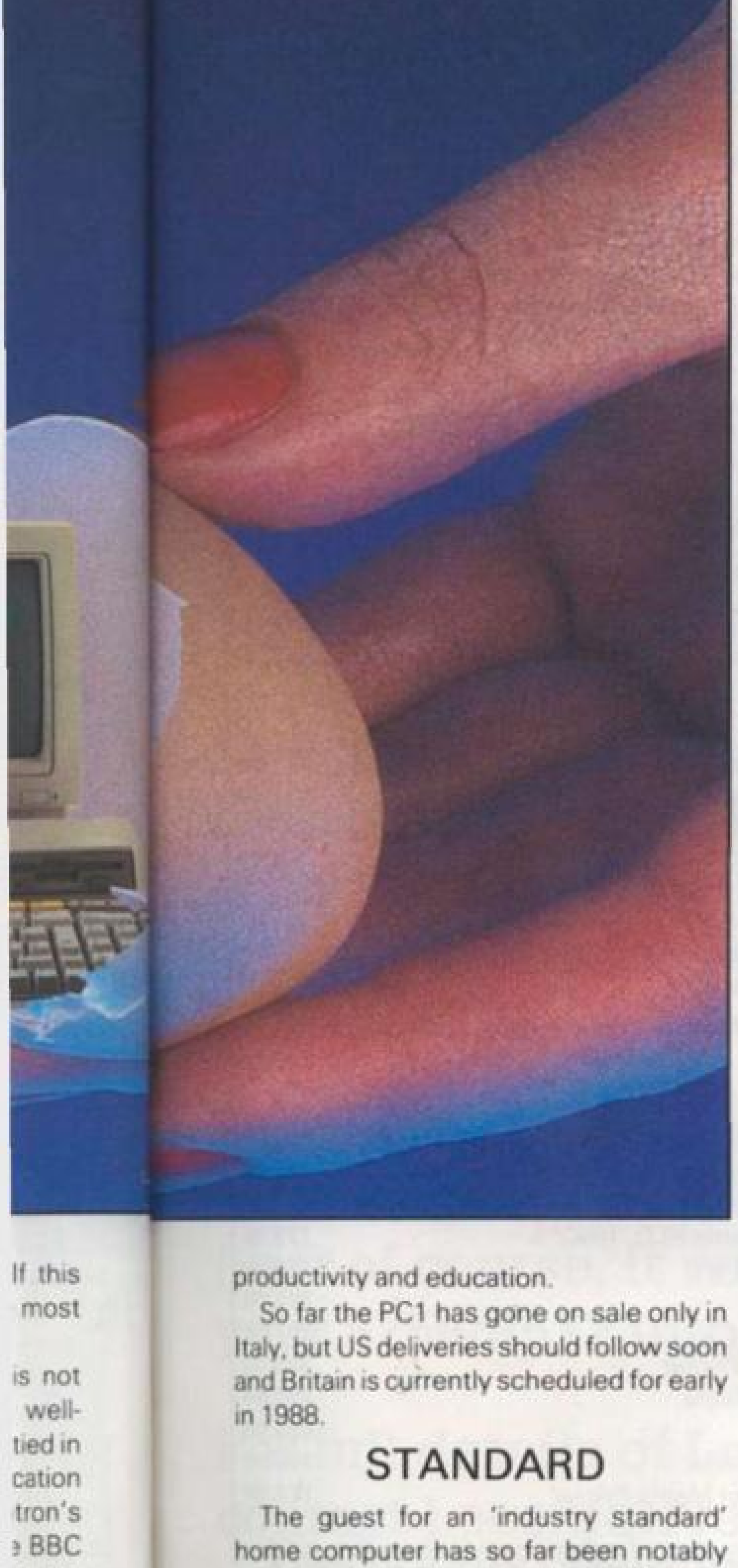
Expansion possibilities include a hard disk drive and a sound module which breaks with traditional PC technology by producing rather more than a half-strangled squawk. We were not able to evaluate this, but Anil Malhrota gleefully described its capabilities as matching those of the Acorn Archimedes. If this turns out to be the case it will be most impressive.

The connection with Logotron is not coincidental. The company has well-established links with Acorn – now tied in with Olivetti – as a result of its education software expertise. Indeed, Logotron's BBC Logo is now bundled with the BBC Master Compact in preference to the Acornsoft version. Logotron has been commissioned by Olivetti to organise the substantial software effort behind the PC1 launch. Finding good PC software is not exactly difficult, but finding programs suitable for home, recreational and educational use as well as in business applications is much harder, especially if they have to be on 3 ½ inch disk and priced to complement a $600 computer.

CATALOGUE

The initial catalogue of 70 titles assembled by Logotron includes a high proportion of games – about 70 per cent of the total. A fifth of the titles are business-related and the others cover personal

AN JOB





Despite large sales of cheap IBM-compatible personal computers even Amstrad has not been able to establish the PC standard as a true home computer. The software for home use has ben slow to appear, at least at home software prices, and so far most Amstrad PC sales have been to business users.

Olivetti could well succeed where others have failed. The machine looks and feels right, the Olivetti name is well respected for quality, and the price seems appropriate. Let the market decide.

productivity and education.

So far the PC1 has gone on sale only in Italy, but US deliveries should follow soon and Britain is currently scheduled for early in 1988.

STANDARD

The guest for an 'industry standard' home computer has so far been notably unsuccessful. The short-lived IBM PC Junior showed that even the marketing strength of the world's largest corporation could not triumph over inadequate design and pricing inappropriate to the market. It is interesting that IBM has just announced a stripped-out version of the PS2 range, the Model 25, to compete in educational markets. However, IBM claims that the PS2/25 will never come to the UK. At US prices of $1300 for the colour system and $1000 for the monochrome perhaps this is a wise decision, even though the Olivetti prices do not include a monitor. Nevertheless, *Your Computer* will be surprised if the big IBM show in October does not display a PS2/25 on its educational applications day.

TECHNICAL DATA SHEET PC1

HARDWARE

Processor:	NEC V40 – 8088 compatible – 4.77/8 megahertz.
User RAM:	512Kb, expandable to 640Kb via bus connection.
ROM:	32Kb for diagnostics and Bios.
Keyboard:	83 keys with alphanumeric selection, 10 functions and a numeric pad.
Monitor:	Graphics mode (CGA) – 640 x 200 black and white, 320 x 200 4 colours, 160 x 200 16 colours. Alphanumeric (font 8 x 8) – 80 x 25, 40 x 25.
Floppy disk:	3.5 inch, double sided, double density. Capacity: 720Kb
Joystick/Mouse:	Cursor emulation.
Interfaces:	Parallel, Centronics type, Serial – RS232, sound (Hi Fi) floppy disk (FDU external from 5.25") expansion bus (IBM compatible)
Options:	Via the expansion bus it is possible to connect a small/half size two card box. The box can house options such as the following: RAM, LAN, MODEM, Graphics controller, CD ROM controller, TV/Telematic adapter, hard disk unit controller, Music Show, Electronic Yellow Pages/VIDIOTEL adapter.

IMAGE BOOSTER

Geof Wheelwright welcomes the Amstrad PC1640, a better-looking prospect for home-users and small businesses than the PC1512.



The Amstrad PC1512 was released little more than a year ago to universal acclaim and praise. One year later, however, sales of the machine have slowed slightly as the number of competitors with machines which beat the PC1512 specification and price grow in number and importance. You can now buy machines from more than a dozen firms – from recent startups like London-based AMT to large, established firms such as Zenith – which offer specifications and prices which either match or beat those of Amstrad.

The machines all fill the gaps in the PC1512 specification which have been pointed out often in the otherwise fulsome reviews of the machine published in the last 12 months. Those gaps include the inability easily to accept third-party displays and display adaptors, the limitation of only two expansion slots on the hard disk model of the machine and the rather stingy inclusion of only 512K of RAM in the system.

As you are well aware by now Amstrad has set that problem to rights with the PC1640, a system which it claims is aimed squarely at the business and corporate computer buyers who may have been scared off the original PC1512 by the Amstrad home computer and hi-fi maker image.

At £799 for the starter-model PC1640 with EGA-compatible display, 640K of RAM and all the other items which have come to be associated with the PC1512, the PC1640 is still no worse a buy for the enthusiast, home user and small business user than an Atari 1040STF, an Amiga A500 or even a BBC Micro, leaving aside for a moment the debate about the new Archimedes.

Impressed

So while Amstrad seems to think that average buyers will be left to pick and choose among the PC1512s in the bargain, the company has still priced the system keenly enough for most moderately-heeled small business, home and professional users to consider running the PC1640 as a main system. In fact, we would guess that a significant proportion of potential PC1512 users will be sufficiently impressed with the PC1640 specifications to throw aside plans to buy the older machine and opt for the PC1640 instead.

So what makes the PC1640 so good? Is it just a PC-1512 with a little extra memory and a display and costing about £300 more than the good old PC1512?

It is easy to see how one could take that view, especially given the widespread acceptance of the PC1512 and the fact that Amstrad is trying to maintain a pricing distance. When you look hard at the PC1640, the differences between it and the older machine are important.

The first and major difference is the Amstrad Internal Graphics Adaptor. It is the Amstrad re-worked on-board graphics adaptor which now supports two important IBM graphics standards which it did not do previously.

The first, of course, is the IBM Enhanced Graphics Adaptor standard about which you will no doubt have heard so much from all the reports about the PC1640. It is a much higher-resolution colour graphics standard which offers a display resolutiuon of some 640 by 350 lines and finally allows IBM colour displays to tackle the kinds of complex and hard-driving graphics required for desk-top publishing or computer-aided design applications.

So that is EGA. The other graphics standard about which you do not hear so much, although for some applications it could ultimately be more important, is the Hercules graphics standard supported by the IGA chip.

High Quality

Hercules is a U.S. maker of graphics cards for the IBM PC which gained its reputation by producing high-quality display adaptors which beat those of IBM and allowed people with humble green screen monitors to get pictures from the original PC which its developers never



The Amstrad PC1640 (left) possesses a clear advantage over its predecessor, the PC1512 (below).



really thought possible. It was so successful that it became the *de-facto* monochrome graphics display adaptor for the PC. Being monochrome, Hercules does not have to worry about devoting any of the display adaptor power to colours, so it offers a superior resolution of some 720 by 350 pixels.

The inclusion of such a graphics output standard on the PC1640 means that over and above the work which can be done with the bundled EGA display you can buy an external monochrome display for £100 or so which you can use for really high-definition work.

That is the second major difference between the way the PC1512 and 1640 handle displays. The PC1512 would not really allow any display other than its own bundled monochrome or CGA-colour monitor to be hooked to it. Not only was there no reasonable way to display the internal display adaptor of the machine to add an EGA card, except the use of a soldering iron and nightmarish tricks several electronic magazines suggested, but even if you managed to circumvent this problem the power supply for the system still rested in the monitor.

Amstrad has fixed half of the problem – in our view, the important half. The PC1640 includes an industry-standard 9-pin display adaptor connection at the back for the use of any ordinary monochrome or other monitor you may want to connect to the system. You can thus have a monochrome and colour display adaptor for use side by side with the PC1640, although there is no way to disconnect the built-in display entirely as it contains the power supply.

The power supply and display connections are separate leads from the back of the machine, so you can disconnect the display part of the monitor without losing the power to the machine.

Who needs to pay the extra money for the PC1640 when CGA colour like the PC1512 is all you may need? A good question and one which should be met by the work Amstrad has done on the expansion slots. In addition to the problems some people encountered with the display adaptor, some found that the limitation of only two expansion slots made life for the ambitious user difficult.

Good value

You will be relieved to know that as part of the re-design of the motherboard, the number of expansion slots left free in the hard disk model is three. That has been achieved by putting the hard disk controller on the main board of the machine, a move most users should welcome, although it has yet to be seen how, if at all, this will affect the large number of third-party hard disk cards which have become available for such systems.

Overall, I must admit to being fairly impressed with the PC1640. I had thought initially it would all be a bit boring but found that after using it for a time I was very reluctant to return to the comparatively muddy monochrome PC1512 screen I had been using.

If you can afford the extra money, I think the PC1640 is well worth the price. It gives you one of the cheapest EGA screens you can get, without sacrificing quality. And with the huge Amstrad network of dealers and the large number of Amstrad-priced products around, you should also have no difficulty obtaining support.



So the games market dominates Spectrum software now. Nevertheless, the original Sinclair Spectrum was conceived as a serious machine and there are still plenty of serious uses and users. First emerging in 1982 in 16K form, followed hotly by the 48K version, the Spectrum was shorn of all the trimmings many of its rivals had – printer ports, add-on chip facilities – to keep the price low; computing power for the masses, rubber keys and all.

Hidden within was the power to do anything any other 8-bit computer could do, disguised by the poor keyboard and that wonderfully cheap and cheerful Sinclair printer. All you needed was the program and the add-on. Manufacturers set about filling the gap immediately.

My earliest purchase was a parallel printer interface, complete, in those days, with printer-driver software on tape – none of this firmware-on-EPROM stuff which is obligatory now – and a printer; a proper, full-size printer, costing an arm and a leg. This, together with a word processing program, gave me undreamed of power. Later followed an add-on keyboard. I suppose this is fairly typical; the first serious application of any home user is word processing.

Of course, the Spectrum has developed. From the rubber-key version to the Spectrum+, with improved but still awful keys; the 128K Spectrum – same keys; built-in serial port, bigger memory; the Spectrum+1 – pleasant keys, tape recorder and joystick ports, too; and finally the +3 – added disk drive and parallel port. Word processing on earlier models will need an add-on keyboard – although Saga Systems has collapsed, dK'Tronics[1] still markets a satisfactory one – and a printer interface. Nowadays, there is a large choice of parallel ones with built-in software, for example Kempston[2], Cheetah[3], Tasman[4] and Ram[5], the latter complete with built-in word processor; The Sinclair Interface 1 is of the serial type and the ZXLprint III[6] contains both.

Apart from general correspondence, I used my old Spectrum for writing scientific articles, which was fairly demanding on the word processing program, and it soon tired of cassette storage. Again, alternative systems were slow to develop because manufacturers were deterred by the rather tardy introduction of the Sinclair Microdrive, which used a tiny cartridge with an endless loop of videotape. It had the advantage of cheapness, small size and weight and ready portability compared to the then available heavy 5.25in. drives

JOHN WASE EXPLAINS THE POTENTIAL OF THE SPECTRUM FOR NON-GAMES APPLICATIONS

and the necessary Interface 1 also had a built-in serial printer-port. They were of limited capacity and, in my experience, less reliable than disks.

As those shortcomings became apparent, disk interface manufacturers moved in. Now there are two popular add-on disk systems. The Opus Discovery, produced for a time in large numbers but now no longer made, although a number are available second-hand, and the Rockfort Disciple[7], very much part of the present scene. The Discovery package includes a 178K 3.5in. drive as number 1; add-on number 2 can be any size or configuration; Disciple runs two drives of any kind. Both interfaces incorporate a parallel printer port, as does the Spectrum+3 behind its disk interface, and a Kempston joystick port; Disciple has many other features as well.

For those on a budget, Microdrives and Interface 1 are still available[8] very cheaply, and there are even a few Wafadrives – the Microdrive competitor – remaining[9], though Rotronics is not; I feel a disk unit is mandatory if one wants to do much more than a few letters.

The Disciple will work with any Spectrum except the new +3 and is therefore the obvious choice, unless you

NO,

are buying a new Spectrum +3. it is particularly fast; it loads 128K in approximately seven seconds, has many additional features and, since a twin 80-track drive will hold more than 1,500K there are no capacity problems.

Finally, for those with only a 48K Spectrum, a useful add-on is a colour monitor interface. Adaptelectronics[10] supplies a good one, as does Transform, and can also supply the necessary lead.

So what software is there? There is a large range of very good, very cheap software available. Take word processors, for instance. When I started to use the Spectrum there was only one word processor readily available, *Tasword 2* by Tasman Software[4]. The Spectrum has a normal screen display of only 32 columns of eight-by-eight pixel squares; Tasman realised that by re-defining the character set on a four-pixel wide by eight-high basis it could put on a display of 64 columns, which is just right for A4 paper, enabling ready implementation of a what-you-see-is-what-you-get display. Although it sounds as if the letters will look odd, they are read easily, even on a common domestic television set – see sample screen dump, figure one.

Tasword 2 is adequate only for small



BUT SERIOUSLY . . .

documents, letters and the like, but is very cheap and easy to use. My wife finds that her class of eight- and nine-year-old children take to it very well. More recently there have been a crop of Taswords. Tasword 3 for the 48K Spectrum holds about 12 pages of double-spaced A4 text as opposed to the strict 10 for Tasword 2; Tasword 128 and Tasword +2 hold around 35-40 pages. Tasword +2, the latest program, has all the normal features one would expect of a word processor – automatic justification and word-wrap; 64-column display with scrolling screen giving a maximum 128 columns for wide printers; easy insertion and deletion; repeat, move, delete or paste – repeated repeat – blocks of text; various layouts; auto header, footer, page numbering, printing of sequential files for long documents, fairly unsophisticated mail merge and conditional printing. This article was produced using Tasword + and the screen dump in figure one is of part of one of the drafts.

The various versions of Tasword are probably the most popular processors. Their biggest strength – and weakness – is in their transmission of printer control codes; they are very easy to insert in text even by eight-year-olds, but they disturb justification. The first Tasword 2 rival, *Spectral Writer*, packaged with the Wafadrive, also suffered from this defect. For Tasword, it can be overcome by fiddling, or by an additional program, *Taspro*, by Seven Stars, which also makes *Qualitas*, a program to make your old dot matrix printer produce NLQ[11].

These days, there are other packages which are hot on the heels of Tasword+2 and in some features surpass it. Following *Word Manager* by the now defunct OCP, we have from Softechnics *The Writer*[12] and *The Last Word*, marketed for a time by Saga Systems and possibly to be re-released for the Disciple. Both the latter packages are available in 48K and 128K versions.

CHEAP

Finally, if you really want only to write letters, the Ramprint interface has its own word processor on EPROM. All the programs are really cheap, none being more than £20, a great advantage of the Spectrum, compared, for instance, to a PC-compatible.

I suppose the next thing the home micro enthusiast wants to do is to write tickets, labels or posters; in other words, a kind of miniature desk-top publishing outfit. The Spectrum screen display, 32 columns and 22 lines, on the one hand makes it relatively easy to manipulate but on the other it is a limit to the resolution one can get with screen dumps, since there are only 256 pixels across the width.

Nevertheless, reasonably impressive results can be obtained with some of the software available, for instance the range of screen dump programs. Some have difficulty in handling shades of colour and one should be sure of the final effect before one buys. *Dumpy*, by Bradway Software[13], represents shades as a series of vertical lines; the results are usually fairly satisfactory. This program allows you to make dumps of any screen you can save in a range of sizes to suit almost any available printer interface; it is very versatile.

The Multiface series of interfaces by Romantic Robot[14] enables you to stop any program and dump a screen to disk – either Discovery or Disciple; it also transfers cassette programs wholesale and contains a toolkit to enable the enthusiast to examine and modify programs. Romantic Robot also does an interface with a dump button. That is less likely to be needed by owners of the Discople disk interface, for this, too, will

both save programs to disk – the snapshot button – and will dump screens in a variety of sizes and fully-shaded.

To draw such screens, there are graphics programs which range from very simple to very sophisticated. Examples of the former include the Bradway *Letta-Head Plus*, intended for letter-heads, invoice headings for small businesses, tickets and labels, and *Linotype*, which turns an Epson-compatible printer into an electric typewriter with a variety of smart display fonts for small business handbills and the like.

Rather more sophisticated and with a somewhat different purpose in mind is the Summit *Art Master*[15], in which a kind of enhanced Basic produces simple screens which are, in turn, compiled to produce compressed code which can then be stored; it is useful for display purposes. Examples of the more sophisticated graphics programs include such programs as the Audiogenics *Icon Graphix*[16], the EEC *Art Studio*[17] and Softechnics *The Artist*[12], in 48 and 128K versions. The most innovative feature of The Artist is its Pagemaker facility; it is a separate program in the 48K package but part of the main program in the superior 128K job, in which it is more powerful. Portions of a screen, or whole screens, can be inserted into pages of text made with The Writer, permitting one to print illustrated texts, or even pamphlets.

The next need of the home enthusiast is filing. The simplest file program is the original Psion *Vu-file*. More sophisticated is the Campbell *Master-file*, which is in a package with *MF-print*, allowing 40 columns or more on-screen and to fit most systems[18]. It has a wide range of facilities. Information filed in Masterfile is compatible with the merge function of the later Taswords, although they can also produce their own lists of addresses and merge data.

FILING PROGRAMS

In addition, Softechnics plans to produce *The Filer*, which will be compatible with The Writer. Other filing programs include specialist programs like *JySis*, the journal indexing system from Ken Spencer Software[19], which I use for filing scientific references, and the more general programs *Superfile* and *V-notch*, both available from Transform[18]. That firm also supplies spreadsheets, such as *Omnicalc*[16], and graph plotting facilities – for example Histograph – together with a range of business software. The latter includes stock control, sales ledger and purchase ledger, and the Business Pack, a suite consisting of bank account, purchase daybook and sales daybook.

In your off moments you can drive an advertising monitor in the shop window, scrolling your message across with D-Lan. Most of the programs from Transform are available in Discovery versions and almost all in Disciple versions.

For programmers, Hi-soft[21] makes compilers for Spectrum Basic which increase the speed considerably; it also makes very good versions of Pascal, C and Fortran. For improved programming in Basic, Beta-Soft does a beautifully enhanced Basic with an astonishing range of features. The 128K version of Beta Basic allows rapid handling and sorting of large arrays up to 64K, enabling large amounts of data to be handled; it is useful for writing specialist programs – Discovery and Disciple versions are available. There are numerous assemblers and monitors, too; Bradway[13] and Seven Stars[13] sell them as well as Hi-soft.

If things go wrong, the Bradway Disc Manager will fix it on the Discovery, while Better Bytes[23] sells a Disciple Disc Manager consisting of a suite of programs – *The Configurer*, *The Autoloader* and *The Catalogue*, which can help.

CHURCH FUNCTIONS

I know of one hard-working Spectrum which is used for producing tickets for church functions, together with posters and programmes. Another is used in a school library, as a catalogue, and yet another is involved in the paperwork for a boat-hiring business in Scotland. The most outlandish use is the storage and plotting of data for plans of prehistoric stone circles and the like. There are many exotic little programs available, too. I have seen a program to demonstrate enzyme kinetics by a university professor and a library of advanced maths/statistics/economics programs – matrix operations, polynomials, integration, regression and linear programming – is available from University Software[24].

Finally, Norman Stewart at the Micro-shop in Glasgow[25] has an enormous range of specialised programs and patches – Vu-calc on the Disciple, for instance – which, together with some home-devised business software can be customised to individual requirements.

All the Spectrum programs mentioned have the advantage of being incredibly cheap; only one or two cost more than £20, many less than £10, and all will run on existing Spectrums/Spectrum disk combinations, although it is by no means certain that versions will be readily available for the new Spectrum +3.

A Spectrum is no good for serious work? There is not much it will not do.

KEY:

1. DK'Tronics Ltd, Unit 6, Shire Hill Industrial Estate, Saffron Walden, Essex CB11 3AQ. 0799 26350.
2. Kempston Micro Sales, 1-3 Singer Way, Kempston, Bedford MK42 7AW. 0234 856633.
3. Cheetah Marketing Ltd, Norbury House, Norbury Road, Fairwater, Cardiff CF5 3AS. 0222 555525.
4. Tasman Software, Springfield House, Hyde Terrace, Leeds LS2 9LN. 0532 438301.
5. Ram Electronics Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA.
6. ZX LPrint III, Euroelectronics, Zlin House, Oakfield Street, Cheltenham, Glos GL50 2UJ.
7. Rockfort Products, Miles Gordon Technology, 81 Church Road, hendon, London NW4 4DP. 01-203 0191.
8. Microsat Communications, Unit 7, South John Street, Carlisle, Cumbria CA2 5AJ. 0228 24579.
9. Logic Mail Order, 17 Leofric Square, Eastern Industry, Peterborough, Cambs. 0733 313870.
10. Adaptelectronics, 20 Starling Close, Buckhurst Hill, Essex IG9 5TN. 01-504 2840.
11. Seven Stars Publishing, 34 Squirrel Rise, Marlow, Bucks SL11 3PN. 06284 3445.
12. Softechnics, 12-13 Henrietta Street, Covent Garden, London WC2E 8LH. 01-240 1422/7877.
13. Bradway Software, 33 Conalan Avenue, Sheffield S17 4PG.
14. Romantic Robot Ltd, 15 Hayland Close, London NW9 0LH. 01-200 8870.
15. Summit Software, Units 3-6, Baileygate Industrial Estate, Pontefract, West Yorkshire WF8 2LN. 0977 797777.
16. Audiogenics Software. 0734 303663.
17. EEC Software: Contact Bill Richardson 0753 888866.
18. Campbell Systems Ltd, 57 Trap's Hill, Loughton, Essex IS10 1TD. 01-508 5058.
19. Ken Spencer Software, 74 Dovers Park, Bathford, Nr. Bath, Avon.
20. Transform Ltd, 24 West Oak, Beckenham, Kent BR3 2EZ. 01-658 6350.
21. Hi-Soft 0525 718181.
22. Beta-Soft, 92 Oxford Road, Moseley, Birmingham B13 9SQ.
23. Better Bytes, 10 Spital Terrace, Gosforth, Newcastle-upon-Tyne NE3 1UT. 091 285 6185.
24. University Software, 29 St. Peter's Street, London N1 8JP.
25. Norman Stewart, The Micro Shop, 271 Dumbarton Road, Glasgow GL11 6AB. 041 334 6163.

The list of suppliers is a selection. The exclusion of a supplier or product does not imply that it is in any way inferior.

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FINGER TROUBLE

Typing ability – fashionably known as 'keyboard skills' – is fundamental to the successful use of computers. Its importance to word processing is obvious, but fast, accurate typing gives a fillip to your use of all kinds of software, from adventure games to spreadsheet analysis or programming. I know this is true, so it is with some shame that I have to report my incompetence with a keyboard, despite several years of computer-bashing. Like many journalists I fumble along at a reasonable turn of speed, using two or three fingers of each hand, staring resolutely at the keyboard in case I get lost.

This practice, according to the editor, is a Bad Thing. It was therefore with some relief that I received a copy of *PC Touch Typist* with instructions from same editor to benefit from its use and write about my experience.

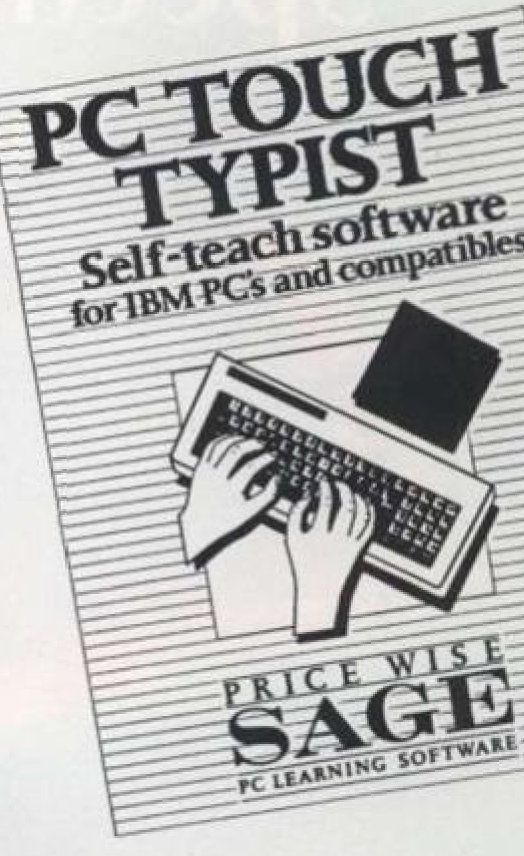
Starting off with the reviewer's usual first reaction – don't read the instructions yet, just load the software and see what happens – I immediately encountered a problem. Transferring the software to hard disk did not work. It is copy-protected and the user is left with no option but to use the original distribution disk – a risky practice.

IRRITATION

Ignoring that irritation I pushed on. The tutorial consists of twenty-two lessons, starting with the use of the so-called 'home keys' where your fingers should return after excursions to the further reaches of the keyboard. Later in the course more and more keys are included in the exercises until you have a firm mental grasp of almost the full range.

A diagram of a PC keyboard appears on the screen, with a pair of ghostly hands covering the keys. Beneath this apparition appears a row of the letters to be practised, and your efforts appear directly below on the next row. Incorrect inputs are rejected: get it wrong and the ghostly hands move to the right position on the keyboard map, highlighting the appropriate action. Places in the exercise row where you made a mistake are pointed out by little arrows so that you can see at once where your weaknesses lie.

A scoreboard at the top of the screen indicates your performance in speed and accuracy. A summary can be printed out for posterity or, if it is too embarrassing, merely displayed on the screen.

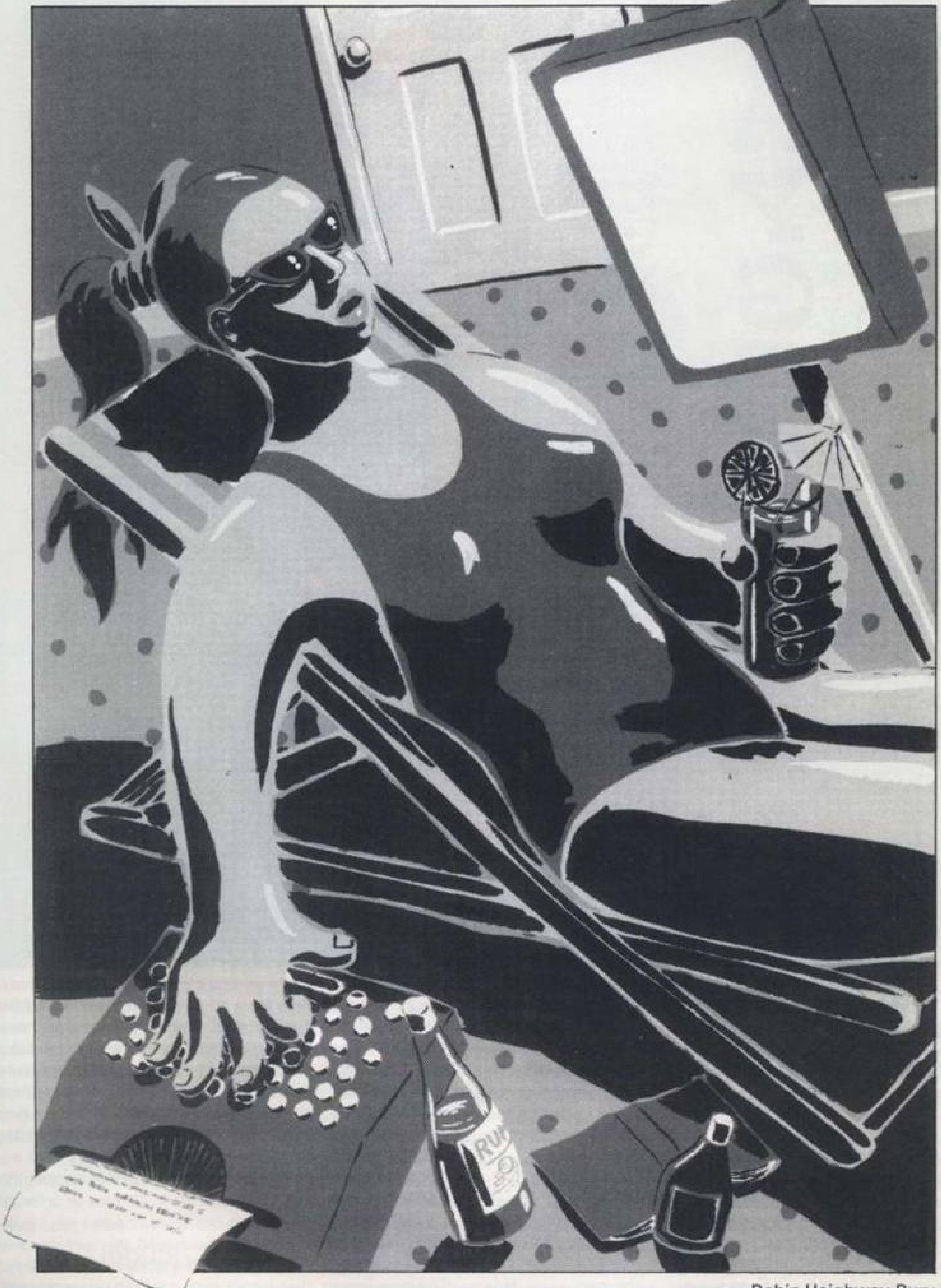


IF YOU TYPE WITH TWO FINGERS, TRY THIS TUTORIAL PACKAGE

Not all the keys on a typical PC keyboard are included, however. The manual states that this is because "the more obscure peripheral keys (e.g. the {} keys) . . . are less commonly used in general typing and are not always in the same positions on the keyboard." Sounds like something of a cop-out to me, especially since Sagesoft puts such keys as CONTROL, ALT, CAPS LOCK and ESCAPE on its map.

A slight anomaly here is that PC keyboards have changed. The position of the keys just mentioned, as well as the backslash (\) and some others varies from model to model even among official IBM products. Take in the burgeoning clone market and the position becomes even more confusing.

Nevertheless, if you want to improve your typing this is a valuable aid. It has certainly helped me in a few evenings of practice, especially by breaking my habit of looking at the keyboard instead of the screen. There is enough going on in the display to draw the user's attention at all times. If your keyboard is of the original IBM PC type you need have no reservations. Even with a more modern type, most of the program is still relevant and should help even complete maladroits master their keyboards. I really must get *Touch Typist* back to the editor . . .



Robin Heighway-Bury

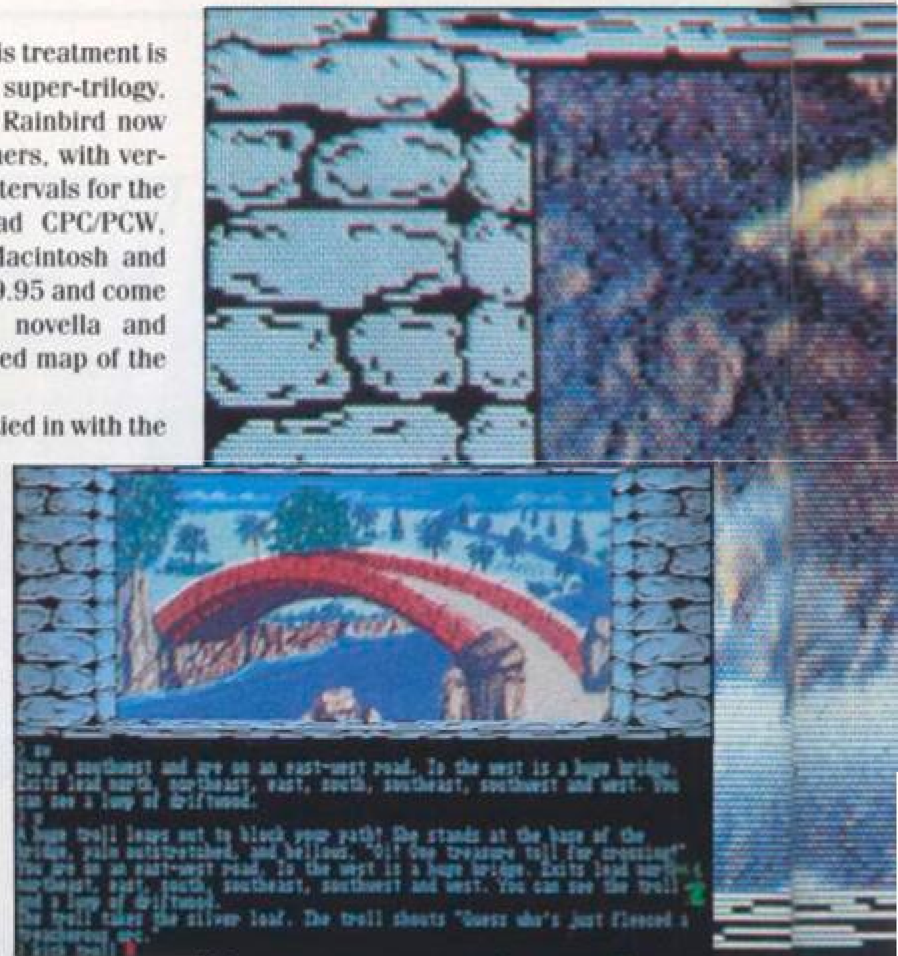
ADVENTURE PLAYGROUND

MIKE GERRARD LOOKS AT KNIGHT ORC, A LEVEL 9 SUPER-TRILOGY FROM RAINBIRD, AND DECIDES THAT IT IS A GAME OF TWO HALVES.

Although when I started the *Your Computer* adventure pages I promised that the column itself would not be cluttered up with reviews of the latest games, I hope readers will understand that just occasionally a game comes along which simply cannot be reviewed in 500 or 1,000 words if we are to do it justice. It doesn't follow that I think the adventure is stunning and wonderful in every way but, as with *The Guild of Thieves* in the August issue, there are some adventures so complex and likely to cause so much interest that a detailed look is definitely needed.

The latest to qualify for this treatment is the long-awaited Level 9 super-trilogy, *Knight Orc*, available from Rainbird now for lucky ST and Amiga owners, with versions following at varying intervals for the Spectrum, CBM64, Amstrad CPC/PCW, Atari 800, Apple II, PC, Macintosh and MSX computers. All cost £19.95 and come complete with the usual novella and playguide, plus a poster-sized map of the *Knight Orc* lands.

The inclusion of a map is tied in with the addition of powerful new features in the Level 9 parser, similar to *Guild of Thieves*, such as GOTO or RUN TO (any location), FIND (any object or person) and FOLLOW (any character]. For this reason, you're actively encouraged not to make a map. Now I'm not convinced about this as yet but at the time of review I haven't seen the poster/map that is going to be included.

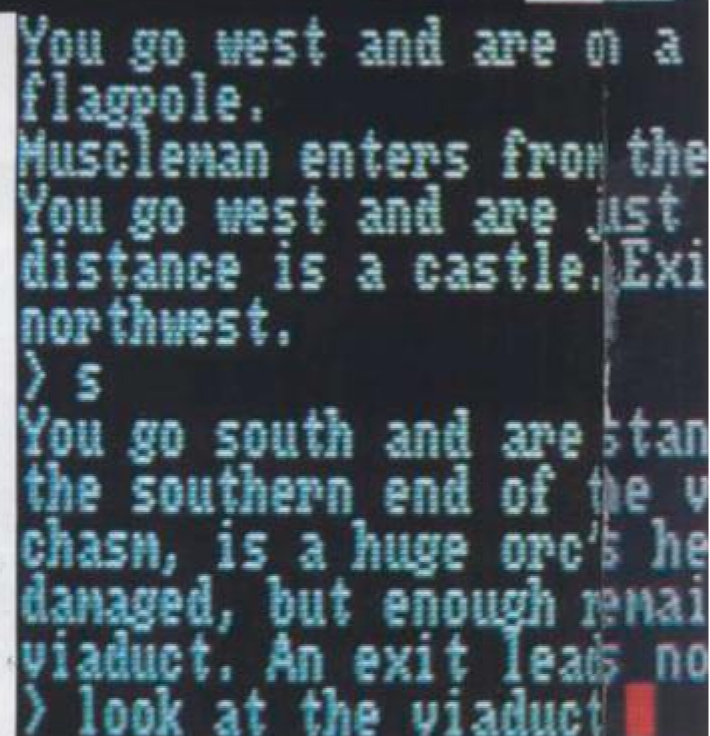


You obviously cannot use a command like GOTO THE CASTLE until you know that there is a castle to GOTO: part of the reason for mapping is to mark the routes you haven't taken as much as the ones that you have, therefore enabling you to be sure you're covering all the ground. Similarly, if you want to FIND THE SILVER SIXPENCE, it may help if you know where you left it in case there's an obstacle in the way that you'd rather not face just at the moment. Maps are fun and also necessary when you're unable to play a game for a while and need to be reminded of the locations and characters before you start again. If the poster that is provided with *Knight Orc* is sufficiently detailed, maybe you can throw your own maps out of the window after all.

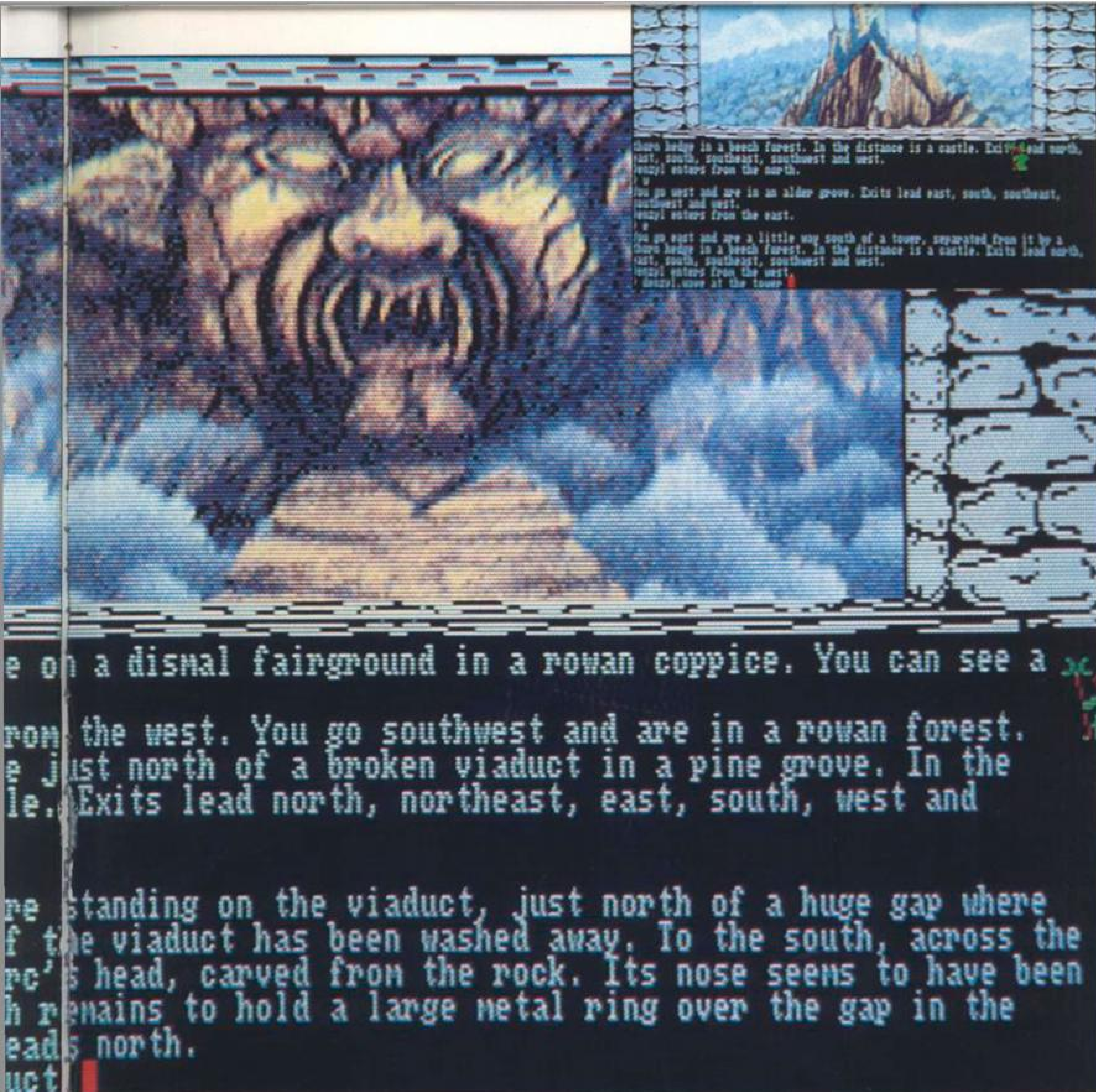
Play guide

Other than the poster, there are no Infocom-type goodies in the box, just the usual novella and play guide that also acts as a copy-protection device by asking you to find and type in a particular word from the text each time you want to RESTORE a saved game. The play guide is essential reading as this is one of those games where you will actually have to use aspects of the complex parser in order to solve the game – it isn't just for show in this case.

The FOLLOW command enables you to tag along with a particular character around the game. This is useful if you want to get some idea of what their movements are and it can also provide you with little pleasing extras that you're not meant to have but which give you a feeling of being one-up on those devious Austin programmers. In one part of the game I wandered into a few dark locations with no source of light but a little later I decided to FOLLOW THE MOUSE. The mouse obligingly went into the dark locations, with me treading on its tail the whole way till eventually it ran under a bed that I didn't know was there – looking under the bed in the dark enabled me to find a hidden object! Ha! Adventurers 1 Programmers 0.



GOTO will take you to a location step-by-step, although RUN TO can be a better option since it can take you there instantly. I discovered the usefulness of running the hard way. Having encountered that old friend the troll toll bridge that was manned, or in this case womanned, by a troll demanding money, I eventually unearthed a bit of hard cash and thought 'Ah-ha, now I can get past the troll!' GOTO THE TROLL. Half-way there I was robbed of my money.



You can interrupt lengthy commands by pressing the space bar, when you are asked if you wish to continue or not. You are not therefore necessarily programmed to continue till you reach the troll but travelling through these lands is a hazardous experience. Having lost an object to another character, it isn't always easy to get it back again without risking a visit to Orc's heaven. Mind you, a visit there is interesting as it opens up speculation as to what may be going on in the game.

Inputs

The program will cope with lengthy inputs along the lines of DROP EVERYTHING EXCEPT THE RED KNICKERS AND EXAMINE THE SWORD THEN GIVE THE AARDVARK TO THE INKEEPER AND ASK HIM FOR A BOTTLE OF OLD FLATULENCE BITTER. Perhaps of slightly more relevance than that is the ability to communicate with the other characters. This goes beyond the usual 'realistic' adventure response of:

What Now: TELL TROLL TO SOD OFF

"The troll greets you and informs you that the King of Belgravia is seeking the holder of . . ." and so on for three screens.

In *Knight Orc*, you'll be able to ask them for information as in an Infocom mystery story (MOUSE, TELL ME ABOUT THE TROLL), ask them to follow you, recruit them to your cause if you've worked out how, and basically ask them to do anything that you yourself might try to do (MOUSE, FIND THE DRAGON THEN ATTACK IT WITH THE HALF-BRICK AND THEN FIND THE WELL AND GO DOWN THE WELL AND GET EVERYTHING AND THEN FIND ME AND GIVE EVERYTHING EXCEPT THE POISON TOADSTOOL TO ME). It might help if you're a bit more sensible about your inputs than the examples given – talking to humans, or even sub-humans like Denzyl (is this the one from *Only Fools and Horses*, I wonder?) might give you a bit more information than talking to mice and frogs.

But never mind reviewing the parser, what about the game? As you probably know by now, it's based on the idea of the Orc striking back. That lowly creature which has been attacked and killed so many times in so many adventures and generally had a pretty bad press has decided to wreak its revenge and escape this mad world of vicious adventurers. The trouble is that this is something of an uphill task as virtually everyone you meet seems to have it in for a poor smelly old Orc.

PLAY ON ▶ ▶ ▶ ▶ ▶ ▶ ▶

As with several recent Level 9 adventures, there is a goodly element of magic involved which requires you to learn spells and cast them at the right place. There is also an element of mystery involved in that you are not totally sure about what's going on. Your visits to heaven, for instance, which will certainly be regular, indicate that there's someone up there who is controlling your destiny – will they be part of the later stages of the game?

When you begin part two you will be wearing a visor, which you're advised not to remove. The curious adventurer will naturally only pause long enough to save the game before doing this and then you discover that you seem to be in some kind of parallel universe set very much in the future – the locations are similar but changed, in that fields have become green carpets and the troll is now robotic. What *is* going on?

What is going on is that you play an Orc with the charming name of Grindleguts, and at the start of the first of the three parts you wake up groaning piteously. Well you might, considering that your mouth tastes like a Hobbit's armpit and one of your favourite activities is eating people's pets. As you come to what senses you have, you discover that you're tied to a horse . . . and that a knight is bearing down on you with a lance. Then WALLOP! You're sitting in a pile of garbage alongside a putty knife and a hooded cloak.

Statue

Disguising yourself with a cloak, you can then wander round and hope to escape these rather dangerous lands. Various bits of gold statue are lying around, like fingers and so on, and I happened across a hermit in a cave. He had some gold leaf and wondered if I'd any curios to trade. I gave him the finger (knowing Level 9's liking for puns, I thought they'd appreciate that) but he just took it and locked it in his trophy cabinet. Oops! Or literally OOPS, as this program allows you to go back a move by typing in OOPS. In fact it seems to work by taking you back not by a single input but by a physical movement, so my OOPS took me to outside the hermit's cave with my finger intact, ready to try a different tack. A combination of subterfuge and violence eventually worked on the hermit, so hooray for OOPS and RAMSAVE.

In time I found myself with a halyard and a hawser, so thank goodness as well for the EXAMINE command which could tell me what these were. In order to tackle one problem I tried tying them together and then, as if by magic, they were joined . . . and I'd scored 20 out of 1,000 points. What an achievement! Escaping from the first part, which is simpler than the others in order to give you a feel for the game, involves boosting your score to 100 points by similar means and crossing a rather large gap. I shall leave it at that.

As with Magnetic Scrolls, this new improved super-intelligent complex parser can prove rather dumb when it comes to coping with the simpler tasks. A note outside the castle drawbridge advises you to knock very carefully. So what would you type in?

KNOCK VERY CAREFULLY
You don't need the word 'very'
KNOCK CAREFULLY
You can't knock that
KNOCK
You can't knock that
KNOCK ON DRAWBRIDGE

The last input got a response, but it wasn't very nice! I didn't really mean to criticise your parser like that! I tried to get Fungus the Boggit-man to knock on the drawbridge for me, but he wasn't having any. Then I found Denzyl and asked him and he agreed, the fool! Mind you, having followed him all the way to the drawbridge he took one look and changed his mind. Not so foolish after all. I asked the passing innkeeper to have a go but all he did was reclaim the cask I'd pinched from his cellar when he wasn't looking earlier on.

Changing tactics got me into the castle by a more devious route but the knight in white satin (and very nice he looked) was none too pleased that I'd sneaked in without knocking. I found and opened a chest and got an interesting response to PUT ALL IN CHEST as "It is open" was printed eleven times in succession down the screen. I suppose it could have been something to do with the fact that I was carrying eleven objects, although one of those was the chest itself, which could have tied the program in knots.

Disappointing

Although part one has been kept deliberately simple, I must say that I found it rather disappointing. The way out has you searching for ten items to link together, most of which are fairly obvious, and I don't really see the point of creating a vast network of well over 100 locations all with simple one-line descriptions that are variations on the theme of 'You are in an alder forst', 'You are in an oak forest', 'You are in an oak spinney'. Some of the descriptions are in fact nonesense, I mean what on earth is 'A holly scrubland' for heaven's sake? Why bother to create all these locations with their identical graphics when you give the player the option to GOTO anywhere or FIND anything – and by getting up high in part of the game you can spot the places and objects you need to get to.

Part two begins with a poetic inscription, which may or may not have been written by Adrian Mole (Poet). As you move around your new locations you'll meet many more characters, also all wandering about. For instance you'll meet the Prophet of Greater Manchester, a tall bearded figure who does all but say "Hello, hello, hello" to you. I did find the intrusion of all these characters completely ruined any sense of atmosphere that was being built up, and all for the sake of a slight joke – very slight in some cases, as with Amazon Grace or the Rainbird that appears.

Kill the Rainbird

The Rainbird was on a perch and out of reach so I was unable to get at it or attempt to wring its neck or anything like that. Later I found a pebble with the one word JUMP inscribed on it, so I hurried back to the Rainbird and tried to jump on to a nearby pedestal (containing a handy reference book) to see if I could reach it that way. No such luck. Never one to flinch from violence I tried to THROW PEBBLE AT RAINBIRD. 'It hits the Rainbird. You hit the smooth pebble the Rainbird. The Rainbird's head vanishes and it immediately grows a new one.' Well I got the drift of the first and third sentences but the middle one baffled me a little, I have to admit.

I also have to admit to very mixed feelings about the game. As a program I think that it's brilliant, apart from a few little bugs – I've mentioned some so presumably there are more. I've been playing a pre-production version in which case some may have been ironed out but Level 9 can usually be relied on to leave one or two trivial little bugs for us to find for ourselves.

The graphics are among the best I've ever seen – with Magnetic Scrolls you admire the detail, but these take a different and more impressionistic approach. Based on paintings by Godfrey Dowson, they are simply beautiful. I also think it's going to give anyone who gets into it terrific value for money. But overall I didn't really find it as engrossing as I had hoped. The humour isn't as outrageously funny as that from Delta 4 and therefore spoils the feeling of the game.

Where Infocom scores over both *Knight Orc* and the Magnetic Scrolls games is that it chooses a subject and sticks to it, be it a sci-fi game, a mystery or just plain funny, whereas these British games are a bit of a mish-mash, meandering around with everything thrown in, from Jerry Lee Lewis in *The Pawn* to jokes about James Anderton in *Knight Orc*.

Every Infocom game has humour too, but it arises from the plot or the inputs you try. I'll certainly be loading up *Knight Orc* again, as there is lots to enjoy about it and lots more I've still to find out about it, but I doubt if, after the initial novelty has worn off, I'll feel compelled to want to play it through to the bitter end.

Carry on Clive

It has been more than three years since Sir Clive Sinclair last released a machine into the computer market, but judging by the time I have spent using the Z88, the first product released by his new company, Cambridge Computer, he has lost none of his skill or entrepreneurial genius.

Yet again, Sir Clive has ignored what most people consider to be the industry standard, MS-DOS, by producing a machine which at best can be described as idiosyncratic. As if to make some obvious concession, Cambridge Computer has produced some MS-DOS software which allows Z88 users to send and receive Wordstar and Lotus files, but this does not really make up for the lack of software choice.

As with everything else that Sir Clive has been responsible for producing, the Z88 is available in a stunning range of colours; black, black or black. This obvious stylistic criticism apart, the designers of the Z88 have done a good job in creating a machine which is remarkably attractive – if you like yuppiesque matt black.

Having paid your money (more than likely a couple of months prior to the machine arriving on your doorstep) it is somewhat disappointing to receive nothing more than a small briefcase-like package, but once you have extricated the machine, the disappointment soon turns into amazement.

Inside this briefcase is the Z88, together with a large and, at first glance, comprehensive-looking guide to the machine. However much you have read about the machine, little will have prepared you to actually have it sitting on your lap. As someone who has used a wide variety of portables, varying from the original Kyocera based machines, to the recent crop of PC-compatibles, the compactness of the Z88 is a revelation.

With a surface area slightly larger than an A4 pad, and weighing less than a hard back book, the Z88 really is the epitome of portability, and even when it is stored in its case – advisable if you want the machine to last – it will comfortably fit in all but the briefest briefcase.

Compact

In simple terms, the reason Cambridge Computer has managed to produce such a compact package is the lack of any normal form of removable storage. When the first rumours of the Z88 started to leak, most people believed Sir Clive would stick with microdrives, as used in the QL. Like the Psion Organizer, however, the Z88 takes a different approach – RAM and EPROM.

At the front of the Z88 are three expansion slots that can take an assortment of RAM and EPROM cartridges. In everyday use, the RAM is both simple and reliable, but if any really important information is created, it becomes necessary to store it more permanently, and that is where the EPROM comes in. Using a built in EPROM blower, the Z88 can copy files and information from the RAM cartridges straight to EPROM.

This is where one of the first limitations of the Z88 becomes apparent. Although the Z88 can accept anything up to three cartridges, the four HP7 batteries used to power the machine cannot produce enough juice for extended use if the three cartridges are used. Currently, in this Z88, I have 128K of RAM and a 128K EPROM as well, and although the batteries can be made to last well, copying files to EPROM reduces their life considerably.

Dead Flesh

As with most of the other products that Sir Clive Sinclair has been responsible for, the keyboard of the Z88 has come in for some heavy criticism, and at first glance you can see why. Made out of the familiar 'dead flesh' rubber that was used on the early Spectrum computers, it feels lifeless to a first-time user. After a few hours use, however, the keyboard grows on you, and I have found it quite refreshing, especially after many hours tapping away on various PCs. The screen too is a great improvement on some of the recent backlit screens I have used. Showing a total of eight lines (which is surprisingly ample), it is one of the new generation of 'supertwist' liquid crystal displays, in this case produced by the printer giant Epson.

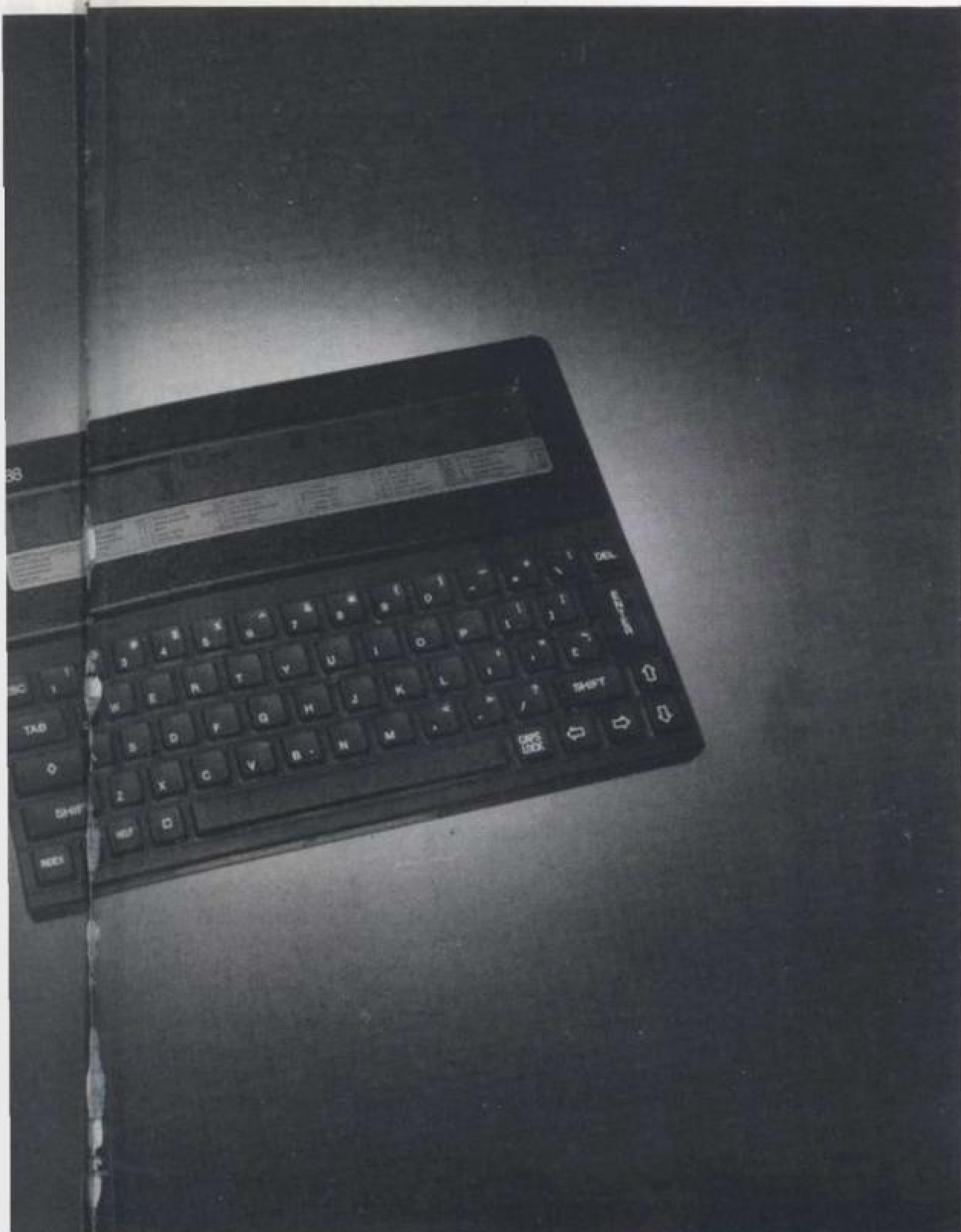
Although the hardware forms the base of the Z88, it is the software that will make or break the machine. Developed in-house, the main part of the software is a generic word processor-cum-spreadsheet-cum-databae called Pipedream.

Quite how they have managed to produce such a complete piece of software is a mystery, but having used all the sections, it is apparent that the software is both well written and, so far, bug free. In use, it is clear that rather than three separate pieces of software, Pipedream is a spreadsheet that has been adapted to be a word processor.

For most of the time this does not prove too much of a problem. As a processor of words, Pipedream allows the user to justify text, set line spacing,



● **The sleek black portable fits into the smallest briefcase.**



SINCLAIR'S NEW Z88 MICRO WILL MAKE A SIGNIFICANT CONTRIBUTION TO THE PORTABLE COMPUTER WORLD, BUT DANIEL MCGRATH STILL HAS RESERVATIONS

set headers and footers, as well as most features Wordstar users will have grown accustomed to. It is when editing previously written documents that the annoying little idiosyncrasies of Pipedream become apparent. Deleting backwards from one line to another is impossible, and cursor movement is confusing to say the least.

If you can be satisfied with the word processing side of Pipedream, then the spreadsheet will come as a revelation. Using a similar format and entering system to such firm favourites as Lotus 1-2-3 and Visicalc, the almost immediate copying and loading from the Z88's RAM means that long and complex tables can be altered and maintained in minutes rather than hours.

Achievement

Where Pipedream excels is for users who combine text and tables to form reports. Unlike programs such as Symphony, data can be changed and recalculated even when it is surrounded by text. Another useful feature for this kind of editing is the novel page map at the left of the screen, which gives the user an accurate picture of how the finished page will be printed.

As well as Pipedream, the Z88 comes complete with a diary, a clock, a calendar, a communications package, file import/export program, as well as an impressively complete version of BBC Basic and a stand alone filing system. All these programs operate with the Z88's unusual menu system which uses the MENU key to pull on to the screen a variety of options.

Technically the Z88 is a real achievement for Sir Clive Sinclair. He has, just as he said he would, released the first truly portable computer that anyone could carry and use constructively. There remain some reservations, however.

The machine is three months late, and so far mine has crashed four times, twice without any warning whatsoever. The exclusion of a parallel port is unlikely to help sell the Z88, even if porting data to other machines is possible (something I would contest having tried unsuccessfully on numerous occasions).

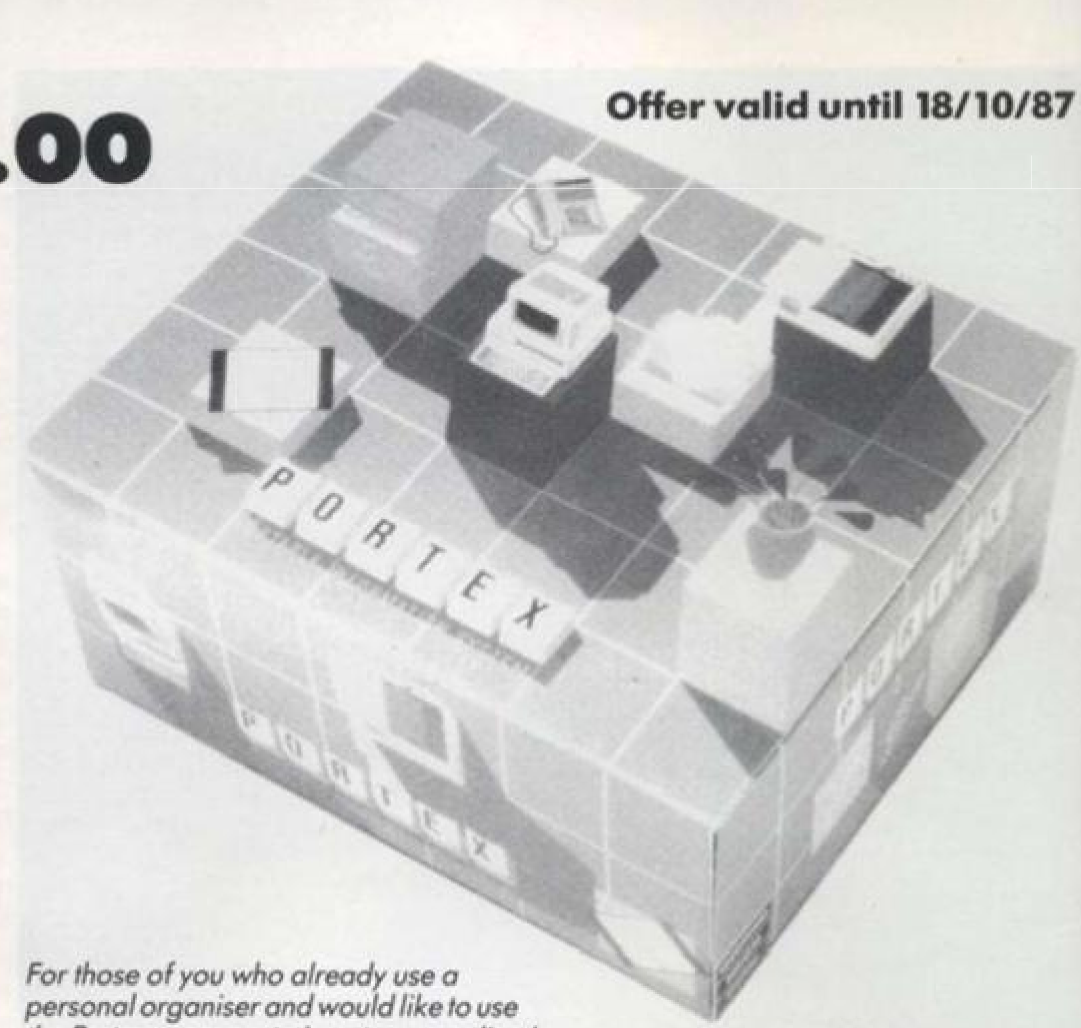
Finally, and perhaps most importantly, the Z88 is to be sold at £290, much more than was originally suggested and, I would suggest, too much to achieve the kind of sales the machine deserves. Yet again, Clive Sinclair has had a great idea, but also yet again, the execution has left a lot to be desired.

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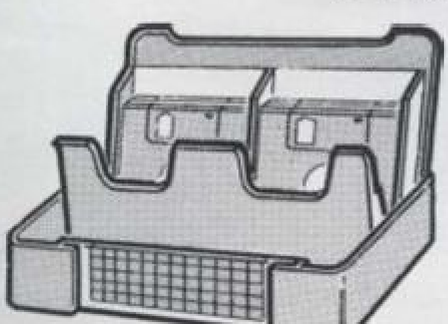
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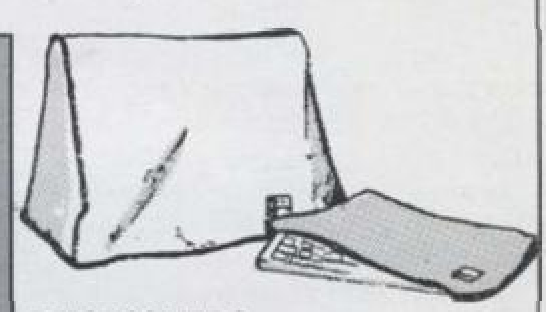
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RAINBIRD

FLYING HIGH

AMON COHEN TALKS TO RAINBIRD ABOUT ITS FORMULA FOR SUCCESS

When you trot along to the PCW Show in a couple of weeks time, you will come across a stand resplendent in royal blue. It will look familiar. It will be the stand of Rainbird and the colour of the decor will be the same as that of its software packaging.

Rainbird is blue. The carpet of its New Oxford Street office is blue, the in-trays, the out-trays are blue and, if you wandered down to the company car-port, it would not be surprising to find the company cars sprayed in the same colour.

"It started when Tony Rainbird was here. They were working on the Art Studio for the Spectrum and it was felt that there should be a house identity," says Paul Hibbard, the Rainbird head man. "Someone said we should go for blue. it was never quite the same shade to start with but not we've spent more money on finding a fixed colour."

The effect of this has been to give the company a strong identity. Walk into a software shop and you can identify Rainbird products in seconds. Rainbird is at the top of the Telecomsoft games hierarchy with Firebird and Firebird Silver beneath it, and it has to present an image of high quality. Each package looks classy with carefully-drawn illustrations on top of the inimitable rich blue background.

"Without mentioning any names, people have started to copy our boxes," says Hibbard. "At one time we were going to have one colour for games, one for art applications and so on but when everyone started to imitate us, we thought we would stay with what we had."

It is no surprise that rivals are starting to flatter with their imitation. In a space of time short even by computer industry standards, Rainbird has flown to a position of great eminence among games software publishers. It is up there now, vying with the likes of the mighty Infocom in terms of the respect with which it is accorded.

The company started in 1985 with a first release, *Music System*, which was taken over from Firebird. This was followed shortly by *OCP Art Studio* for the Spectrum, although what really made things take off was the release of *The Pawn*, one of the best-selling adventures of recent years.

The biggest seller to date has been *Starglider* which was launched in October last year on the ST and is still making significant sales. A 3-D space adventure by Jez San, it is surely one of the finest games in existence. The Pawn, an adventure located in the imaginary country of Kerovnia, set the humorous tone which is so much a part of the Rainbird identity with the machinations of the Farthington Real Ale Company and the distinctly dubious Boris Grunchkev O.K.B. This game has enjoyed similar longevity to that of Starglider.

"We're much more interested in long-term stuff," comments Hibbard. "The charts don't really reflect our sales but our bank balance does. I can assure you. It is because our product sells steadily over a long period that we do a lot better than many apparently successful software houses."

The secret of the Rainbird success lies in great measure in its identity as part of Telecomsoft. With a specific brief to attack the top end of the market and no worries about capital investment, Rainbird can afford to be choosey. Hibbard hopes that the bubble won't burst so long as the label refuses to sit back and take it easy with the same old format: "What we are doing in the next few months is streets ahead of anyone else because we have put the time and money into it. Programmers trust us too because they know that we are not going to go bust next week and that they will be paid regularly. Many programmers have been ripped off in the past."

Hibbard should know. He has been one himself. He first made contact with Rainbird when working on *Silicon Dreams* and then found himself taken on as a staff employee. Before he knew it, he was elevated to the position of head of company.

On meeting him, one is impressed by his authority which comes not from declaiming loudly the merits of his company and the faults of all the others but from speaking in a very quiet yet genuinely commanding voice. This man is the Ken Livingstone of the software industry. Not bad for a former musician and Ford middle-management person, although it must be said that he possesses the loudest suit and designer stubble this side of Alan Sugar.

Comfortably reclined in his big boss seat at one end of the open-plan Rainbird office, Hibbard and his glamorous press person Clare Edgeley, former Sinclair User hackette, readily offered their opinions on the state of the 16-bit market, our relationship with our American friends and other pressing matters in today's exciting world of computer gaming.

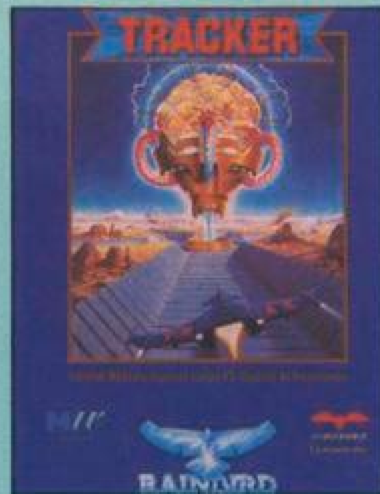
The American market is extremely important to Rainbird. It has been more successful there than virtually any other British software house. Indeed some of its products are rather better sellers Stateside than in this country. Re-orders are still being made in the U.S. for *Tracker* which was a relative failure here.

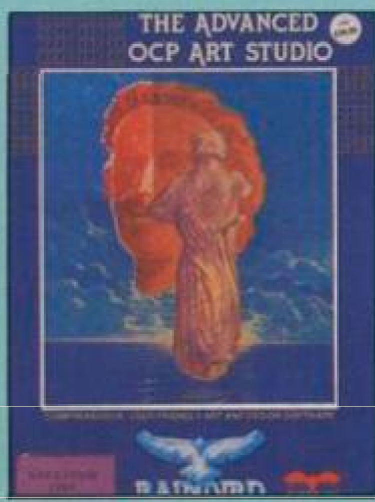
Opines Hibbard: "The average age of the punter over there is much higher



● Hibbard on left surrounded by of Rainbird's best selling game

'The increasing sophistication of the product is shown in the titles to be released'.







than here; about double. Because they are older they go for games requiring depth and strategy. Younger people tend to go for the shoot-'em-up games. Our products are geared for disk-based machines, giving us a smaller market in the U.K. Then again, it allows us to make our games more sophisticated. If you go into a computer shop in the States, they have never heard of cassette-based machines.

"In Europe, France tends to be more in line with the U.K. in preferring shoot-'em-ups. In Germany they tend to lean more towards the adventure side."

"We've had some very successful adventures in Germany," says Edgeley, "even though they are in English. The Pawn, Silicon Dreams and Jewels of Darkness are always in the top ten."

One of the YC team suggests that the reason for the favouring of adventure games in America and Germany is that they have higher relative disposable incomes in those countries:

"Certainly I think that has got something to do with it," says Hibbard. In the States they've all got lots of money to spend, they've all got disk drives. The U.K. tends to follow behind in certain respects although the U.S. follows us in others, particularly in terms of quality.

"When it comes down to entertainment software, we are far ahead of the States. I think our programmers here are generally much better. We started out with cheap things like the ZX-81 and the Spectrum. Going along that path, the British have really had to put in a lot of effort to squeeze something out of that machine. The Spectrum is a perfect example: the difference between what you got out of it when it started and what you get now is quite incredible.

"The Americans haven't been through the same sort of learning curve. With the advent in this country of the 16 bit technology, the programmers who have been through all that are suddently free, elated with the graphics and memory they now have before them."

Hibbard feels much the same about university-trained programmers as he does about Americans. Having done computer studies at college and then progressed through business machines and mainframes, they are unable to cope with the constrictions of 8 and 16 bit machines. Not much use to Rainbird really, although it is more than likely that the company will soon start to develop 32 bit software for the Archimedes.

At present, sales are shared fairly equally between 8 and 16 bit. This is because Rainbird has a very high share of the 16 bit market – about 50 per cent according to Hibbard. He feels that the gap between 16 bit and 8 bit is going to widen and it may well be that in the near future Rainbird will discard the latter in favour of specialisation in the more sophisticated machines.

The increasing sophistication of the product is shown in the titles to be released by Rainbird in the next few months, some of which you will be able to see at the PCW show. One of the projects in hand is a simulation of a futuristic aircraft-carrier. In conflict with a force of similar strength, you are disputing the soveregnty of a group of islands at the end of the 21st century. The task is to capture the enemy's home island or to destroy its carrier. Much strategy is involved in the game as well as the fundamental shoot-'em-up element.

Also being previewed at the PCW show is a new project by Sandy White and Angela Sutherland. Called *Dick Special: The Search for Spook* (Gedfdit?), the plot revolves around a boy's hunt for a missing canine friend known as Spook. What is innovative about the game is that it features the first fully-animated character under the control of the player. It is almost an interactive cartoon available on your computer.

The graphics really have to be seen to be believed in Dick Special. Alluding with perhaps a certain degree of lewdness to the title, Hibbard assures us that it is "something big and special".

Another imminent release is the *Universal Military Simulator,* a war game which simulates battles from many different eras all the way from Attila the Hun to the Eighth Army. Provision is made for the player to build his own army and, most intriguingly, to mix and match historical periods on the battle field.

"You could put Napoleon against Genghis Khan and see what happens," says Edgeley. "It's not your average pixellated war game. it has almost a 3-D look to it. Nor is it one of those slow games where you wait for Napoleon to move to the fourth hill on the left.

The company will remain one to watch for the trends it sets. Hibbard shuns the usual approaches such as market research because it means that "you just stay where everyone else is in the field. The excitement for us working here is wondering what we can do next that will be innovative.

"Because we're always trying to push for new ideas, I feel we're going to do something wrong eventually. I'd like to think that we won't. We put out things that we think are terrific. That's what makes working here exciting for us."

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Best Before '86

Commodore has been going through a rough time recently. Facing everything from lawsuits with former boss Thomas Rattigan to problems with pricing the Amiga cheaply, sufficient to compete properly against the Atari ST range of 16-bit computers, the former king of the U.K. home computer scene wears a heavily-dented crown.

If the launch of the Commodore 128D at the last Commodore show is an indication, it will take nothing short of a palace revolt to get the company back into the throne taken from it a few years ago by Sinclair and then Amstrad. The Commodore 128D, a three-box version of the Commodore 128 with separate keyboard and display, was given the full fanfare of a new product launch, yet represents nothing more than a re-announcement of a two year-old product.

When we recently spoke to the company about this odd move, a spokesperson tried to suggest that the 128D was a different machine from the first version we saw more than 16 months ago. She said the original machine was a portable because it had a handle at the front and the keyboard clipped underneath. The new model does not have such a handle and is therefore different.

"Does it offer anything not on the original machine?," we asked. "No, not really," was the reply.

Thus we concluded that this new Commodore small business computer was nothing more than the good old Commodore 128D with the carrying handle removed.

OLD

Although it is not normally the policy of *Your Computer* to write articles about new two-year-old computers, it is also not normal for computer manufacturers to claim as new something which is, at best, a middle-aged product. For that reason, we present an appraisal of the machine, with the proviso that you should not be fooled into thinking that the Commodore 128D is in any way a new system.

The 128D was first shown to the public at the Which Computer? Show in Birmingham in January, 1986 as a sub-£500 system which would be available to users almost immediately, although the machine had been previewed to journalists in the preceding months at computer shows in the U.S. and elsewhere.

It was reviewed, subsequently and favourably, by me in the March, 1986 edition of this magazine and praised as a machine which was a little on the expensive side, compared to the Amstrad PCW8256, but offering sufficiently attractive features to make it worthwhile to consider as an Amstrad CPC or PCW alternative.

POOR

By September, 1987, however, the Commodore 128D looks a distinctly poor buy. Although it includes both the 6510 and Z-80 processors, 128K of RAM, a single disk drive and the CP/M operating system, along with a design which gives you a proper PC-style keyboard and full compatibility with the Commodore 64 and the Commodore 128, at £399 it is just far too expensive for what you get.

With systems such as the Atari 520ST which have far superior specifications to the 128D at £299 and the Amstrad PC1512 for a mere £499 – the ex-VAT price for the basic model, including a monitor – you would be hard-pressed to find many reasons, at least ones which had to do with money, for buying the 128D.

The 128D, however, is not entirely redundant. If, for example, you are a long-time Commodore 64 owner looking for a migration path to a more powerful machine but do not want to lose your big investment in data and software, the Commodore 128D is the best type of improved Commodore 64 you can buy.

It offers a full Commodore 64 emulation mode, with all the traditional Commodore 64 interfacing, and the 80-column screen and improved Basic provided by the Commodore 128 side of the computer. The detachable keyboard means that you do not have to suffer the problems created by trying to move the keyboard when computer and keyboard are the same unit.

In other words, the Commodore 128D is a good buy for Commodore 64 fans, perhaps in the same way that the Apple IIGS is well worth buying for the hardcore Apple II fans. Neither of those machines is at the centre of the current bulk of software development, nor are they, at least in the C128D case, technological equals of their peers.

As a one-time Apple user, the 128D puts me in mind of a debate I once had with a friend after the launch of the Apple IIc. I left that event convinced that Apple had a winner on its hands with a portable system which included an 80-column display, offered 128K of memory, a built-in disk drive and serial ports – all things which had to be added to the old Apple Plus via expansion cards.

With a wry smile on his face, my friend suggested that to be fair I compare the Apple IIc with other computers available for the money.

For the rest of the world, the 128D is a bit of a dog. There are still comparatively few business applications which need the extra power of the Commodore 128, let alone the 128D. So if you do not already own a Commodore 64 and you buy the machine for the Commodore 64 compatibility, you would probably do better to save £200 and buy a basic Commodore 64C.

Thus I cannot recommend seriously anyone, except the most hardened Commodore fan, buying the Commodore 128D. It is not even any cheaper than it was when Commodore unveiled it.

EXPENSIVE

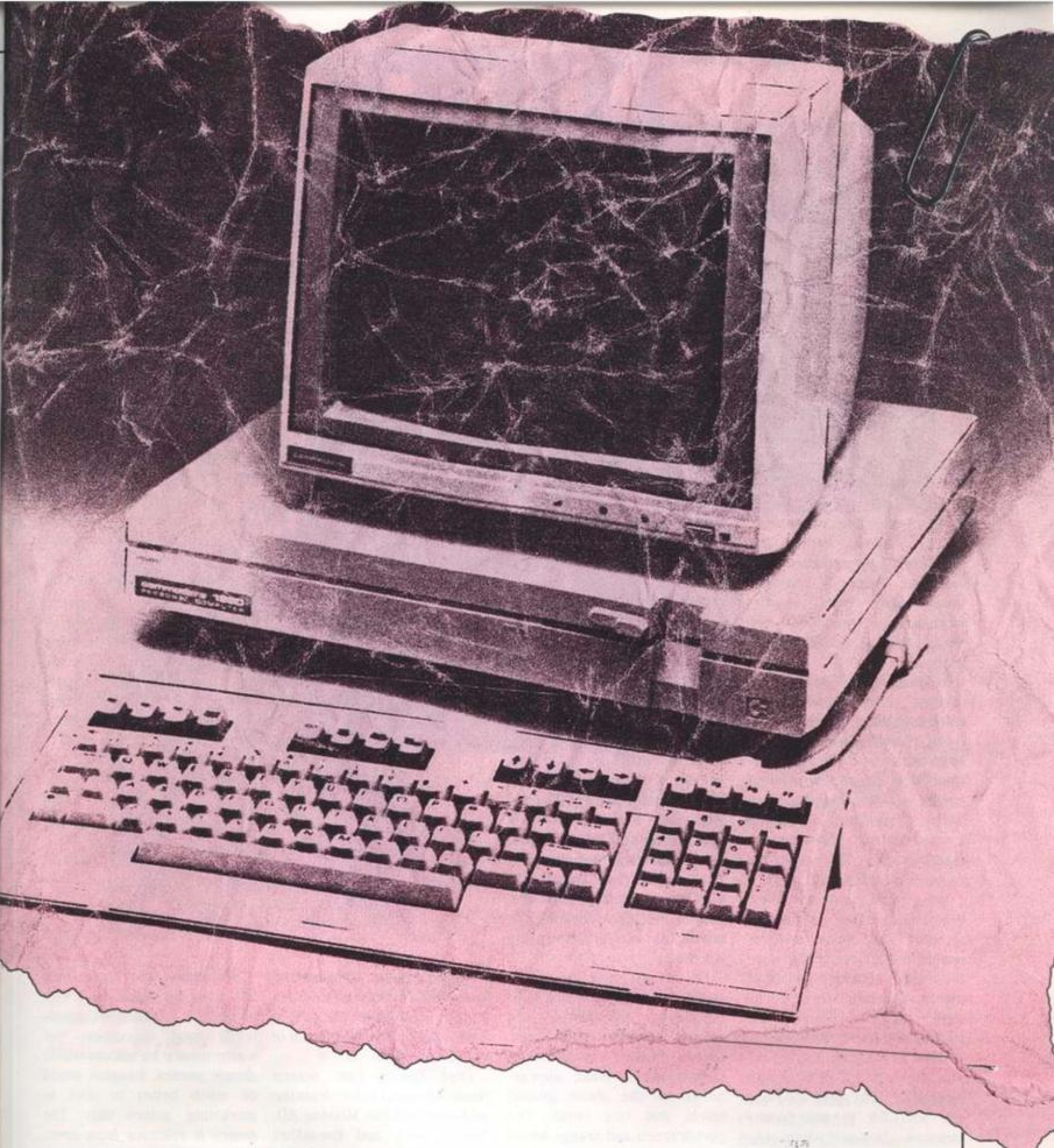
In January, 1986 when Commodore first showed the machine, it was to be sold for less than £500 with a monochrome monitor – average cost to buy separately, about £100. Late in 1987, it returns with the same machine at £399 without a monochrome monitor. So it is clear that the 128D has not become cheaper to make in the intervening 16 months.

That is a pity. I believe that if the Commodore 128D were priced properly at less than £200 and replaced the current Commodore 64C and 128 offerings, which are both getting very long in the tooth, it could be an exciting and interesting offer.

As it is, the price is far too close to the existing 16-bit machines from Atari and Commodore and it does not offer sufficient extras to compete with the other Z-80-based machines from Amstrad under the CPC and Spectrum banners.

In short, the Commodore 128D is not a good buy but do not think it will not do an adequate job for you as a small business machine – it will.

There are too many other machines, including the Atari ST and even the Commodore Amiga A500, which will do it at a much better price for this to be much of a point in Commodore's favour.



RE-ANNOUNCING THE COMMODORE 128D, A TWO-YEAR-OLD MACHINE WHEELED OUT OF RETIREMENT TO COMPETE WITH THE ATARI ST WHICH COSTS £200 LESS. GEOF WHEELWRIGHT REPORTS FROM THE LOCAL OAP HOME

SOFTWARE RELEASE

Magmax

£8.95 cassette 64/Amstrad; £7.95 cassette Spectrum; £12.95 disk 64/Amstrad. Publisher: Imagine



After approximately a year and a half, and a good sprinkling of hype, comes Imagine's next Nichibutsu arcade conversion.

Five Magmax droids are standing between an alien invasion and eventual conquest. Unfortunately most of the weaponary is spread out over the horizontally scrolling landscape.

Your aim is to survive the various landscapes by collecting extra pieces of your robot. This increases firepower by an extra sprite. Another novel weapon is the lance, used to spear certain indestructible aliens. From time to time you have to destroy a three-headed metal dragon. This generally requires all fire power.

You can go above and below the planet surface via a series of lifts, the lower caverns usually being more hectic. Here the enemy activity consists of mobile and stationary aliens as well as near-impassable bridges and barriers.

What is Imagine playing at? This game is full of bugs and irritations. Why does the inlay say RETURN is the pause/unpause button when the buttons are F1/F7? The dragon sequence in the 64 conversion is completely pointless – a static creature with two heads and no neck (three heads plus necks in the arcade version). What is the point of having orange bomb-bases if at one point you are going to change the screen colour to orange? Consequently the bases become black dots with an outline of the actual base there.

Why have the coin-op's original colours been changed from a brown and grey bas-relief combination to blue, pink and purple? It looks disastrous. The aliens, by the way, have discovered the secret of eternal life – you shoot them and they still chuck bombs even when dead and gone!

If you get killed anywhere while still fully armed, the game decides you don't deserve to play any more and duly crashes. (If you are above ground, the landscape turns to garbage as a warning.)

On one occasion the enemy sprites were turning black, to explosions, to garbage, to normal again. Sometimes, cavern based (two-dimensional) aliens make appearances on the above ground levels and vice versa. The garish green and orange would have been better as the green and light green seen in the advertisement. If the cavern backdrop could not have been achieved exactly, the Amstrad look should have been adopted, a black screen with the cavern detail on the top and bottom of the screen only.

Fred Gray's title screen music – I expect better from the man who did the Mission AD, Army moves and Breakthru music. That Ocean loading music appears again! This is another in the 'I'll lock up if you press RESTORE' series.

Sometimes the bases only half blow up. What is it with Imagine? It can turn out consistently good conversions yet waste money on unconvertible arcade games. Imagine would do much better to stick to marketing games only. The games it releases from specialist software are much superior to those produced in-house.

Kenneth Henry

Vampire Killer

£20.95 MSX 2
Publisher: Konami

Drac is back! Actually, the devil is back as Dracula, but all the same, it's up to you to rid the world of him. You control a character called Simon Belmont and you stand all alone against the forces of evil . . .

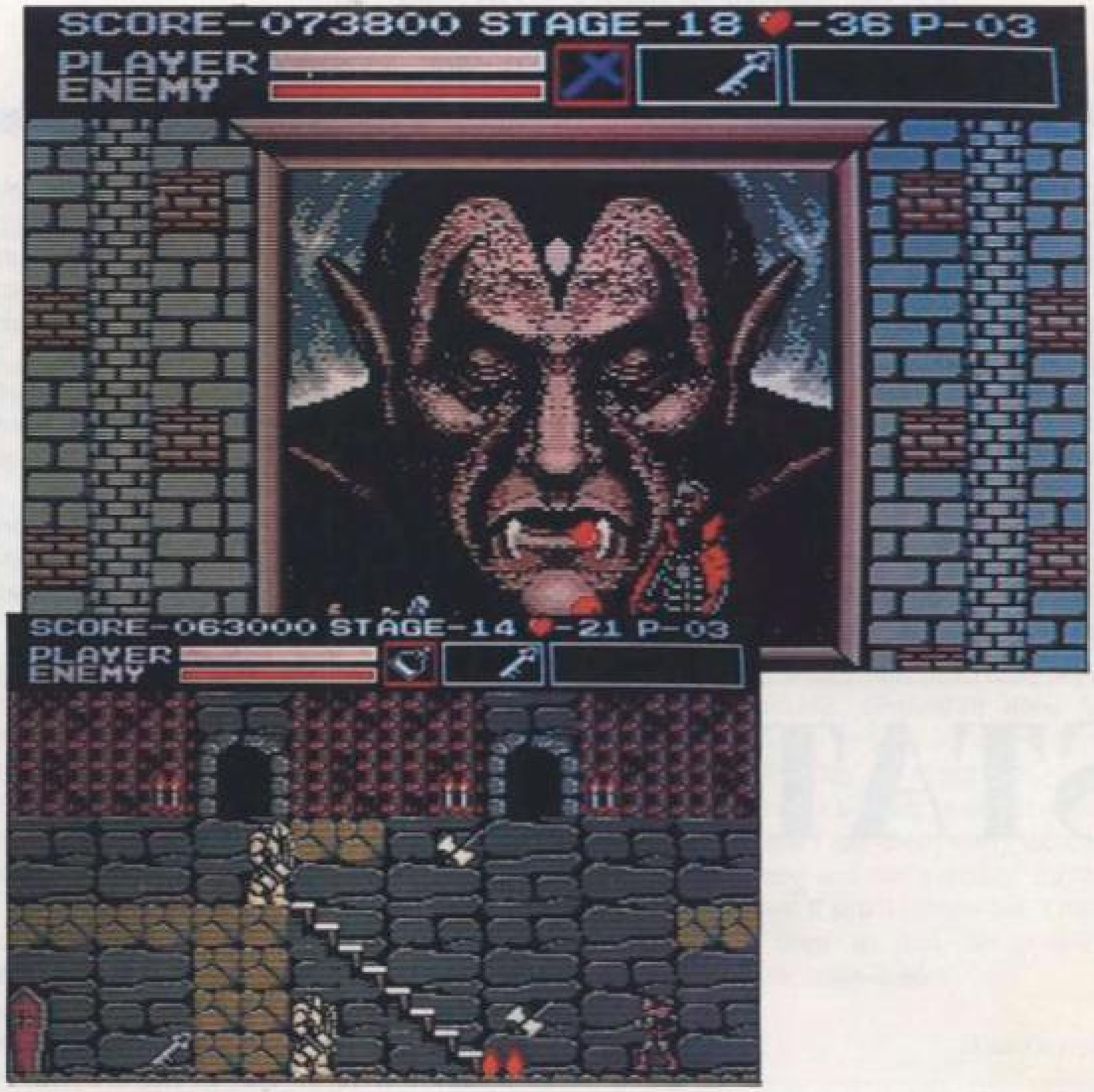
The idea is to advance through eighteen gruelling levels, defeating all that stands in your way and collecting various magic items in an attempt to defeat Dracula. After every three levels there is a Chamber of Evil where a really awful creature hangs out.

Obviously, it must be overcome before you can continue.

At the beginning of the game, Simon has just a magic whip but as he progresses through the castle he will find other weapons and items. These include a battleaxe, a broadsword, various crosses and rings, holy water and even an hourglass which will stop all of the enemies for a couple of seconds. These can be found in a number of places, such as behind candle holders or walls or in treasure chests.

An old crone appears on certain screens and it is possible to trade in hearts collected on your travels for variuos items. She seems to charge ridiculously high prices, though, so killing her can be quite satisfying.

As Simon goes about his task he will encounter some rather gruesome and nasty creatures. When I say that there are too many to list, I'm not kidding – but, believe me, they pack a mean punch.



This is the first MSX 2 game that I have played but I am overawed. The graphics really do look as if they have come straight from the arcades.

But does that mean that the final game is a little boring? Don't you believe it. The gameplay is absolutely awesome, it'll knock your socks off! Rarely has a game been packed with such sheer quality and excitement.

Vampire Killer is possibly the best game that I have ever played – I can't say enugh about the stunning graphics – the sprites are wonderfully crisp and colourful and the backgrounds are beautiful.

B. Riber

Bridge Player 2000 with Tutor

£19.95
IBM PC; Atari ST; Amstrad PCW 8256/9512
Publisher: CP Software

As we all know, PC users are highly sensible people who would never dream of indulging in the pranks practiced by the home computer users. No Commodore Carnage or Spectrum Splatter-time for Mr Businessman.

What Mr Businessman wants when he is off duty (glass of duty-free Scotch, call me Barney) are all his old favourites; traditional sports and card games now available on the PC so that he can play them without having to talk to anybody. This is why it is called the personal computer; its owner can conduct most of his daily affairs through it without having to come into contact with anything unpleasant like social interaction.

Thus we have *Bridge Player 2000 With Tutor* available from CP Software. Learn a game intended for four players and then play it all by yourself. If you do not wish to enrol with the local bridge club, this program is an acceptable substitute for those who don't mind missing out on the complex psychological relationships built up during a session round that little green table.

The blurb on the back of the package claims that it is suitable for both the expert and the beginner but the consensus of the players of varying abilities to whom Bridge Player 2000 was known is that really the beginner would find it a more worthwhile investment, almost any computer program simply not being sophisticated enough for the experienced player.

The tutorial part consists of twenty set hands. Ego is south and has to decide what to bid for himself although the computer takes care of the North partner. The computer only accepts your bid if it is the appropriate one for the circumstances. Once the contract is made, the North

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hand is exposed to the view of Ego and he plays for both. When the hand finishes, an explanation is given on the screen of how both bidding and play shoud have progressed, a very useful feature which makes it instantly clear where one has made mistakes and how they can be avoided in future similar situations.

The graphics are simple but effective. On the Amstrad PC1640 the whole screen is covered in a bright but not garish green background which draws the player's attention to the outline of square in the middle on which the play takes place. The cards are not represented as cards but as two characters, the number of the card followed by the symbol for the suit to which it belongs. Some people found this symbolic representation of the cards difficult to grasp, but personally I found it kept the screen pleasantly uncluttered.

The fully-fledged bridge game simulation is reasonable but unsophisticated. A competent player would have little trouble in outbidding the inbuilt system (believe me, if the editor of *Which PC?* can beat it, anyone can).

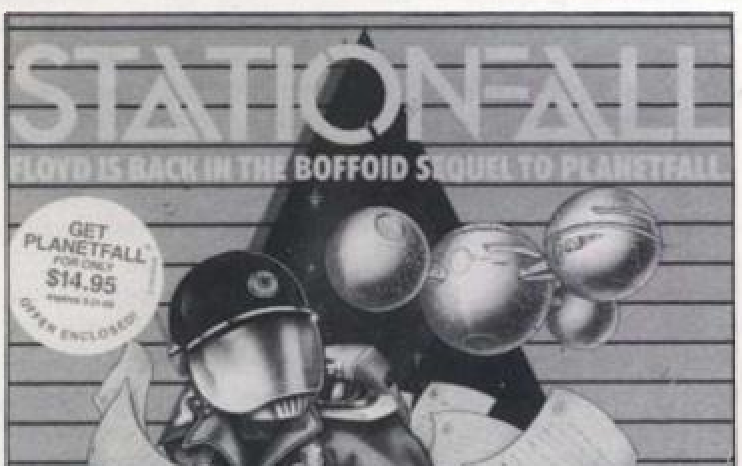
This does not prevent Bridge Player 2000 from being entertaining or even good practise, particularly if Barney the relaxed Businessman has £20.00 to spare. Having seen other bridge simulations, admittedly on the inferior PCW, this definitely ranks as a superior example of the genre. I still recommend however that you try playing real Bridge instead; at least you won't be drinking scotch on your own.

Raphael Sergei

STATIONFALL

£24.99 Atari 8-bit, CBM64, Amstrad CPC and PCW; £29.99 Apple II, Macintosh, ST, Amiga, PC.
Publisher: Infocom

Can it really be five years since your heroic work to rescue a doomed world in Planetfall? Five years, why in the adventurer's time-scale that must be, what . . . at least twenty Infocom adventures ago. Surely not! No matter, your heroic work did not go unrewarded and you were prommoted to Lieutenant First Class.



That's the good news. The bad news is that it was on the paperwork task force. The good news is that you still get sent on exciting assignments! The bad news is that the task force's idea of an exciting assignment is to send you to a Space Station to pick up a supply of Request for Stellar Patrol Issue Regulation Black Form Binders Request Form Forms.

Does something tell you that author Steve Meretzky has picked up more than a smidgeon of influence from his contact with Douglas Adam's Bureaucracy? Whether Stationfall has also been influenced by Steve's own recent Leather Goddesses of Phobos remains to be seen. Mr Meretzky's other interactive endeavours have been Sorceror, Hitchhiker's Guide to the Galaxy, A Mind Forever Voyaging and of course the original Planetfall, so that's a pretty impressive track record.

Just to get you started, there's an 'easy' section which requires you to get from your own Stellar Patrol Ship to the right Space Station. This requires a careful reading of the three forms already in your possession at the start of the game (copies in the packaging), and making sure you put the right forms in the right slots. Of course the Assignment Completion Form hasn't been authorised yet, so you can't get back home till that's done.

You can choose your robot companion for the trip using your Robot Use Authorisation Form, and when you go to the Robot Pool can there possibly be any other choice than your robot companion from Planetfall, good old Floyd? Well you can try choosing Robot Helen or Robot Rex if you like, but once Floyd looks up from his game of marbles and spots you with such obvious delight it's really no contest.

At the flick of a few buttons and a bit of clock-watching you're docked on the Space Station Gamma-Delta-Gamma with your survival kit to hand: a blob of orange goo, a blob of gray goo and a thermos flask of blue soap. I doubt whether this is of any use in enabling you to

survive your first encounter, which is when a hull welder robot approaches you with its welding extensions quivering with excitement. Yes, the Leather Goddesses have obviously got to Meretzky!

It doesn't take long before Floyd has found a friend on board the strangely deserted Space Station. This is a book-loving robot called Plato, who seems quite taken by the works of the 77th century poet Ignatius Tomato. The two faithful companions will follow you round your initial explorations of the ship and give you many a laugh on the way. Make the most of those laughts, though, as things start to get sinister.

In the Engineering Office you discover the diary of a Professor Schmidt who was studying an unusual pyramid which had been discovered aboard a derelict alien space ship and brought here. Did that say an alien ship? And you're on board a Space Station with its deserted corridors? Oh-oh! And instead of Sigourney Weaver for company all you've got is Floyd (no offence, Floyd).

Elsewhere you find a scribbled note saying "Schmidt – why didn't I see it until now! Just think of this station as a cell and the pyramid as a mechanized bacterioph." The note ends there and seems to have some reddish-brown stains on it. Gravy? Ketchup? A blob of orange goo?

The Captain's log provides some very interesting info when you play it back, including the information that a used-spaceship dealer in the village is selling modified Patrol ID cards – could be useful as your own card won't open some of the security doors. There's also a message about the Reproductions Officer, which sounds like an interesting kind of job till you realise it refers to reproducing the forms you've come to collect. This is quickly followed by a message in the Deep-Space Comm Centre from your boss, the Forms Control Officer, telling you they've found 2000 reams of the forms you're looking for in a mislabelled pallet so abort the mission and come home. Now he tells you?

This is where the troubles really start. The machinery that hasn't broken down completely begins to act funny.

Needless to say (so I'll say it) this is the usual excellent Infocom game of great detail, humour and complexity. They're incapable of producing a duff product. The only criticism you could possibly level is that perhaps the parser doesn't recognise all the words it should – like when you're told that all that remains of the log reader is a black scar, and you try to EXAMINE SCAR, it doesn't know the word "scar".

This seems to happen more than it used to do. A little message saying you don't need to use the word, or a Level 9-like "That's just scenery" would be better, but this really is nit-picking. Stationfall does full justice to Infocom's, and Steve Meretzky's, reputation, and there's nothing to do but repeat what I say about every Infocom game and that's simply "Buy it!" Now if you'll excuse me, I think I need to look for a used-spaceship dealer . . .

Mike Gerrard

Penguin Adventure

MSX1, £18.95; MSX 2, £20.95
Publisher: Konami

Nobody can say that being this penguin is a cushy life. First Konami forces him to race around Antartica and now he has to fetch a golden apple to save his girl friend (penguinette?) from a fatal disease.

Mr. Penguin has to complete 24 treacherous levels to succeed, each one totally different from the others. He (or rather, you) must risk his life travelling through forests, caves, mountains, down rivers, under water, over ice and across many more hazardous terrain. However, if it's any consolation, old Pengy no longer has to worry about that annoying sea lion out of *Antartic Adventure* – although you will have to watch out for the other nasties that have taken his place! And, unfortunately for you, contact with one of the creatures results in a rather unspectacular death for our cute hero, so watch it!

The fish leaping out of the ground (or whatever) are also evident, but in Penguine Adventure they serve a purpose, as you can barter them for extra equipment. There are over ten items to buy and if you haven't enough fish then a quick go on the trader's slot machine may help!

At the end of every three levels you will come face to face with a thing called Phrysaruses. You must ether knock spikes into the ground, creating a hole for the nasty to fall into or give him a headache by jumping up and shooting him with a gun that you might have acquired on the way.

At the beginning of the game you are confronted with an animated opening screen, where Pengy sheds a tear at the thought of his girlfriend. From here on it the action is furious and the graphics are fantastic. The speed of the scrolling is unbelievable and the colour scheme is absolutely stunning. The two Penguin states at the



● Pengy makes it to the forbidden fruit.

end of most levels are superb, as are all of the sprites and backdrops. The music and sound effects are equally as good too, if not better. Konami has brought out the best of the MSX sound capabilities with over twenty high quality sound tracks to listen (or dance!) to plus very realistic effects.

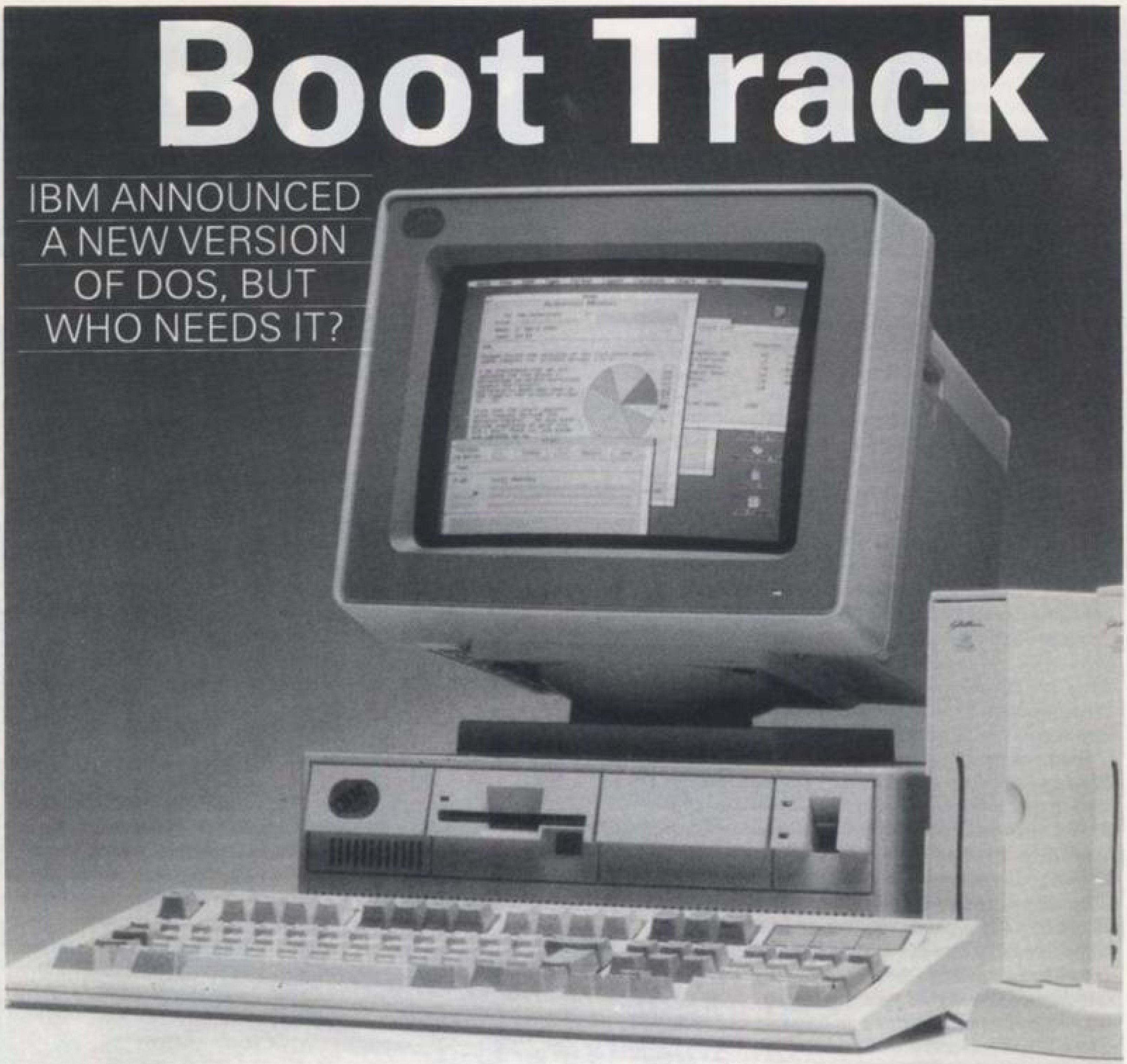
As you would expect from Konami the game is varied to the last, especially in the sound and graphics departments. Also, as it's on a megabit (128K) cartridge it's going to be a long time before you get bored.

Simply describing 'Penguin Adventure' as state of the art, isn't doing it justice. It's a brilliant game worth anybody's money.

B. Riber

Boot Track

IBM ANNOUNCED A NEW VERSION OF DOS, BUT WHO NEEDS IT?



When IBM announced its PS/2 machines earlier this year it also announced a new version of DOS to fill the time before the new operating system, OS/2, is released. This new version is DOS 3.3 and is available for all IBM PC-style machines, such as the XT and AT, as well as the PS/2 machines. It is supplied on 3.5" disk and 5.25" disk in a plastic folder, together with two manuals and a quick reference card.

Who needs DOS 3.3? It is very unlikely that any current DOS 3.3 user would bother to upgrade – the advantages are not great enough to outweigh the cost and the trouble of re-installation. Although IBM has attempted to make installation of the new DOS as simple as possible, it still involves at least half an hour of an experienced PC user's time. Corporate users are bound to find that hard to justify. Users of earlier versions of DOS, such as 2.11, may consider that the extra features *are* worth having.

What does DOS 3.3 offer over DOS 3.2 and earlier versions? To the average user, not a lot. To be honest, DOS 3.3. doesn't even offer much to the 'power user', unless that user is obsessed with the need to give his PC a strong national identity. This seems to be DOS 3.3's main new feature – greater support for non-American countries. That's not quite true of course, DOS 3.3 supports extended batch file processing in that it offers the CALL command. This allows one batch file to call another. Older versions of DOS would end the first batch file before starting the new one, while DOS 3.3 will suspend the first while the second is run.

A new command FASTOPEN keeps track of recently-opened files on a given drive and allows faster re-opening of those files. This may be useful to those without a hard disk, or with a badly-organised hard disk, but it seems that DOS 3.3 is really intended to show international users of IBM's PCs that the company still cares.

The documentation is interesting. One of the manuals is a user's guide, intended to train the absolute beginner in the mysterious ways of DOS. To the novice user it probably is fairly useful, but to the experienced PC user it is extremely frustrating due to the vast amount of information it doesn't contain. It's full of pretty pictures though, featuring a yellow parrot doing useful things like trying to insert a disk into a drive.

The other manual is an abridged version of the DOS 3.3 reference manual, the full version of which is available as a separate product. The problem with this manual is that it's so abridged as to make it almost totally useless. It seems that if you want useful technical information, you gotta pay 'n' pay. In DOS 3.3's case, it's hardly worth the effort.

ALL SYSTE

EXPERT SYSTEMS CAN THINK FOR THEMSELVES WITH MICROCODIL. JILL PHILLIPS EXPLAINS.



Artificial intelligence has a powerful, if unhelpful mystique. Ask a number of computer buffs about AI and you'll come away with the feeling that it's 'a good thing' or 'the way computing is going'. What you won't come away with is any idea about what AI actually *is*.

There are few tangible results from AI development. Only expert systems have really made any public impact. They have already appeared commercially and are starting to make an impact in the business world.

An expert system sounds like the kind of thing that needs a mainframe computer and teams of earnest programmers ready to devote their lives to it. In fact, you can now build your own expert system with nothing more impressive than a BBC micro and your own devotion. The reason is a new programming language called MicroCODIL, designed specifically for building the kind of databases and knowledge bases on which expert systems rely.

Let's look a little more closely at what is meant by an expert system. Without getting too bogged down in theory, it essentially means a program which, when fed with information on a specific subject, can then draw conclusions and suggest courses of action.

To do this it needs facts, in the form of a database. It needs to have these facts linked in meaningful ways. This linked data is a knowledge base – and that's where MicroCODIL comes in.

The classic AI languages are Lisp and, more recently, Prolog. Lisp is one of the oldest programming languages around and has been used for a wide variety of applications but its ability to link data, using lists, has made it a natural for work with knowledge bases.

Prolog, and its later micro versions, is more recent and more specifically aimed at AI. As well as providing the means for linking information, it also allows you to build rules which then provide the significant links between data.

Sophisticated

MicroCODIL does this too, but with one significant advantage over the other languages – it doesn't expect you to conform rigidly to a particular data structure. It allows approximate matching and fuzzy logic, so that even if any new information doesn't fit comfortably with the way the program is organised it can still be entered and used.

It has another advantage too. Micro-Prolog is available for the BBC micro but it is a memory-hungry language. That makes it very difficult to do anything meaningful with it. MicroCODIL, on the other hand, is optimised for the Beeb, and leaves plenty of space for data.

Dr Chris Reynolds, based at the computer science department at Brunel University, originally developed the language for use on minis and mainframes. Indeed, one of the advantages of investing your time and energy in a language like this is that you have the backup of someone who is enthusiastic and dedicated to it. The software is continually being updated, for example.

The name CODIL stands for Context Dependant Information Language. The original work on the language was started around 20 years ago, and when the software finally appeared it found applications in medical records and statistical surveys.

Interest in the language grew, not least because it was featured on *Jim'll Fix It*. With the help of the MEP – a now defunct body which was responsible for a lot of

EMS GO



educational software development – the program was transferred to the BBC micro.

The language looks odd to anyone who hasn't graduated beyond the standard languages like Basic and Pascal. If you've dabbled with Prolog, however, you'll probably pick it up very quickly.

Essentially, programming in MicroCODIL consists of entering groups of facts and the rules you need to act on them. Programs can act by themselves, as in the case of one demo program supplied to us which created random and extremely bizarre news stories but the main use for the language is as knowledge base with which the user can interrogate.

The software is supplied with several example databases. These include a small French-English dictionary, details about British birds, historical databases and so on. The music file is particularly interesting as it shows the software's ability to use hardware features of the BBC micro – something you wouldn't necessarily expect from a knowledge base, certainly not from a database.

To make it compatible with all BBC micros, yet avoiding wasting memory, the software uses a mode 7 scren. The presentation is colourful and well designed. A nice touch is a small window where you can see the program 'working' as it searches its database.

● Left: History Project-one of the first databases for MicroCODIL



Leaving the computer to work out apparently random information gives you the feeling that real 'intelligence' is at work, that the program has some kind of intuition. That's being fanciful, of course. After all, the computer had to be programmed to act by itself. But the effect is the same, and it means the language is better at coping with the kind of vague, intuitive knowledge which you find in the real world.

Fascinating

MircoCODIL has obvious applications in education. I wouldn't go as far as saying that it should replace other languages, like Micro-Prolog. That is not to suggest it is in any way inferior – it is simply that children should have experience of as many languages as possible – especially Prolog which is becoming very popular both in academic and commercial worlds for producing expert systems.

What will really make it work in the classroom is that it is fun. The software is robust enough for children to be able to play around with, exploring the database – which is how it should be used.

To exploit fully the system needs a fair amount of hard work getting the programs and data into the machine. Suppliers are therefore sensibly lining up a large range of databases to be sold as optional extras. The first to appear was the History Project, based on a group of Hertfordshire farms and farmers in the 19th century.

With packages like the history project becoming available, MicroCODIL is potentially a very powerful teaching tool. And it's use isn't restricted to the classroom. Even if you have no real application for a knowledge base, playing around with this language can be entertaining and will give even the average micro user some insight into the problems and approaches facing those working in artificial intelligence.

Naturally, with something this sophisticated you expect to have to do some work just finding out how to use it. Fortunately this has been cut down to a minimum through the use of a sensible 'user interface' – that's what you see on the screen – and a thick but well-pitched manual. The book strikes a reasonably even balance between a simple explanation of how to use the package for those with no interest in the nuts and bolts and an in-depth tutorial for programmers and general wireheads.

This is a fascinating language for anyone who wants to spend some time and effort learning about knowledge bases. It will prove useful to anyone who has a genuine need for a flexible and intelligent database, from amateur genealogists to teachers and historians.

The software is available in several formats. On double-sided disks (DFS or ADFS) it costs £50. Single-sided, DFS format puts the price up to £60. A 'hi' version, for use with second processors is available in DFS format for an extra tenner. The ADFS version already has the HICODIL program with it.

A spare manual and site licence for five copies is also £10. Alternatively you can get a licence for 15 copies and two extra manuals with the Econet version, which costs an extra £20.

The History Project Pack costs £10. ADFS users can get a special deal of the Micro CODIL language plus History Pack for £40.

Codil Language Systems, 33 Buckingham Road, Tring, Herts HP23 4HG

DEBUGGING

DEBUGGING IS AN ART WHICH NEEDS TO BE MASTERED BY THE ASPIRING PROGRAMMER. SIMON SHEPPARD INTRODUCES THIS TRICKY SUBJECT IN THE FIRST OF A SHORT SERIES.

Imagine, if you will, a sort of computing equivalent of the menopause. Your computer regularly crashes at a certain point in an applications program, you're in such a foul mood that the dog, your live-in girlfriend and your Best Friend (who seems to get on suspiciously well with your girlfriend) have all retired to the pub to get out of your way, your hair is thinning more rapidly than usual because of all the pulling and you seem to be developing a nervous tic in one eye. And all because you can't get into WYSIWYG.COM without a major crisis.

The solution, of course, is plain and simple. All our troubled individual requires is a firm, working knowledge of the MS-DOS utility program DEBUG. Using Debug he could trace the application program step by step, examine the text or data files to check for corruption and thus pinpoint the problem. He could also do with a new Best Friend, but that's another matter entirely.

Debug is a complex and powerful tool, able to perform all sorts of wonders like customising software and disposing of dongles. However Debug is probably the pinnacle in "user-hostile" software – most casual browsers entering DEBUG at the MS-DOS prompt are likely to quit at the sight of a lonely "–" prompt.

MEMORY

Debug is really nothing more than a window on memory. Going into Debug without specifying a file enables you to browse around memory at will. For example, entering DEBUG at the prompt and then issuing an R (registers) instruction gives a screen display similar to that shown in Fig. 1. Here we see the contents of the general purpose registers, the state of the segment registers and the flags of an Intel 8088 or 8086 microprocessor. Before getting embroiled in exactly what a segment register or a flag is, we have to do a spot of maths.

Computer instructions for a 16 bit microprocessor are made up of 16 bit binary words – such as 1100010100000011 – sixteen digits each of which is either 1 or 0. Because this is not the sort of thing people like to deal with first thing in the morning (not even computer programmers), this is converted to hexadecimal arithmetic, i.e. base 16. So instead of counting 0,1,2,3,...,7,8,9 and then 'rolling over' to 10 we go 0,1,2,3,...,8,9,A,B,C,D,E,F and then roll over to 10 (hex) which is 16 (decimal). Simple isn't it?

Fortunately help is at hand in the form of Debug's H (Hex arithmetic) instruction. This gives the sum and difference of any two hex numbers, which makes calculations a lot easier. For conversion of hex numbers to decimal, probably the easiest thing to do is to buy a calculator with the necessary features – Sharp makes one which is very reasonably priced. All of the numbers Debug will ever throw at you will be in hex and most of the time it's sufficient just to stay with hex notation and not bother to convert into decimal and back again.

So what do all the numbers in Fig. 1 mean? For a full description of the 8088/

fig 1

```
A>DEBUG
-R
AX=0000 BX=0000 CX=0000 DX=0000 SP=FFEE BP=0000 SI=0000 DI=0000
DS=05D9 ES=05D9 SS=05D9 IP=0100        NV UP DI PL NZ NA PO NC
05D9:0100 B82013       NOV        AX,1320
```

tbl 1

A(address)	Assemble
Crange address	Compare
D(address) (value)	Dump
Eaddress (list)	Enter
Frange list	Fill
G(=address1)(address2...)	Go
Hnumber number	Hex
Iport	Input
L(address)(drive record record)	Load
Mrange address	Move
Nfilename (filename)	Name
Oport byte	Output
Q	Quit
R(register)	Register
Srange list	Search
T(=address) (value)	Trace
U(range)	Unassemble
W(address)(drive record record)	Write

fig 2

1024k = FFFFFh	
	BOOT ROM
FE000h	
	SCREEN RAM
F0000h	
	MEMORY-MAPPED I/O Parallel, Serial, Disc, Codec . . .
E0000h	
	USER RAM (Maximum 896k)
00400h	
	INTERRUPT VECTOR TABLE
00000	

8086 architecture you have to consult a reference book – the sort of book which makes excellent bedtime reading because it sends you straight to sleep.

fig 1: **Screen display after entering R.**

tab 1: **Debug commands**

fig 2: **The memory map of the Victor Sirius**

INSTRUCTION POINTER

One of the most important registers (if it can truly be called a register) is IP, the instruction pointer. It is the contents of IP which tell the microprocessor the address of the next instruction to be executed. In Debug IP always starts at 100h, not 0 because the Debug programme itself reserves the first 100h as its 'trapdoor' to the 64k (less 100h) segment of memory which can be manipulated at any one time.

The thing to do, of course, is to plunge in and experiment. Find a freshly formatted disc, then add on Debug and any other files you want to have a look at, hack, or generally play with.

One of the most simple and useful applications of Debug is discovering the nature of mystery files; let's say you have a file on your disc called SOMEFILE.MUK and you don't know where it came from – whether it's code or some long forgotten (but possibly valuable) doodlings on your word-processor. It might even be a fragment of disc salvaged by the MS-DOS CHKDSK utility. You don't want to 'type' it to the screen because there's a strong possibility that doing so will crash the computer – so Debug it. A few applications of the D command will soon show the nature of the file.

A copy of the Debug documentation can be obtained from one of the DOS manuals, normally giving examples in the use of each command. There are two golden rules to observe when using debug: always operate on a copy (this should be obvious to everyone and his grandma by now) and always issue an R instruction before a disc Write. This will normally ensure that IP is set to the start of the file (100h) and enables this and the file length, shown in the CX register, to be checked before the Write. If these two parameters are not correct, the wrong section of memory will be written to disc.

RANGE

Provided you are operating on a copy, as detailed above, the very worst that can happen is that you hang the comuter. A list of Debug commands is given in Table 1. The items shown in brackets are optional. A range is both the start address and end address and delimiters (separators) are either commas or spaces. Thus

D100 323
D100,323
Dds: 100 323
Dds: 100,323

all do exactly the same thing, that is dumping the memory between 100h and 323h onto the screen. The ds: part is unnecessary here because the Data Seg-

tbl 2

Physical address	Segment: offset	Decimal (1k = 1024)
20000	2000:0	128k
40000	4000:0	256k
60000	6000:0	384k
80000	8000:0	512k
A0000	A000:0	640k
C0000	C000:0	768k
E0000	E000:0	896k

tab 2: **Converting a physical address to a logical address**

ment DS is the default segment for the Dump instruction as, naturally enough, the Code Segment CS is the default segment for Unassemble.

The Registers instruction really is the secret to using Debug successfully because these default segments can be changed, by using an RDS instruction for example. Here again you'll have to issue another R command to 'log' the change, in a similar manner to the way an R instruction normally moves you to the top of a file before a disc Write.

Debug doesn't care whether it receives commands or data from you in upper or lower case. Commands are shown here in upper case for clarity.

HOW TO DEBUG

If all this seems a bit daunting then what we need is a simple and easy example of just what can be done with only an elementary knowledge of this extremely powerful tool. Let's say that you're the proud owner of a copy of Wordstar version 3.3 and you're fed up with staring at the copyright notice at the beginning because for one thing it is full of grotesque American spellings and for another you got your copy of Wordstar by swapping it for Supercalc with your mate down the road. So here we go, no more agony:

```
A>DEBUG WS.COM
-E02d2
05D9:02D2    10.0
-R
-W
-Q
A>
```

Here 10 (which is hex, remember) is the original byte and we enter 0. The location 02D2 in WS.COM just happens to store the amount of time you're expected to sit and stare at the copyright notice. When using the Enter instruction, the space bar moves you on to the next address without changing anything and a <CR> returns you to the Debug prompt.

Now the first thing any connoisseur of Debug requires is a collection of them: there are several different versions. DOS 2 Debugs include an assembler while DOS 1 Debugs are much smaller. At least one of my DOS 2 Debugs doesn't like having sizeable 'command' files piped to its input and refuses to compare blocks of memory. Also, some Debugs won't do string searches such as

Scs: 100,2000 "Demonstration Version Only"

so you'll have to go off and use another. The DOS 3 Debug has an extra P command but the documentation for this has never been seen.

Figure 2 shows the memory map of the Victor Sirius. I could show the map of a PC clone but frankly it's a mess, not at all a pretty sight. All computers will have a memory map similar in at least some respects to the Sirius memory map shown here.

Armed with a knowledge of exactly where a chip sits in the memory map, a nice fresh copy of Debug and our rapidly blossoming expertise in the use of it, we can write directly to the screen, the ports, and anything else which takes our fancy. Browsing around the memory map is just a matter of specifying a segment: offset address – CS:127, DS:1000 and 2000:0 are all examples of this format. All are acceptable to Debug.

ADDRESSES

Like any computer program, Debug talks in terms of logical addresses but the physical address in the 1024kb address space (in our case) is

SEGM	**segment**
OFFS +	**offset**
PADDR	**physical address**

In other words, take the most significant part, the segment, and add the least significant, the offset, but shifted one digit to the right. The only thing to remember is that this is Hex arithmetic and you have to count to F before carrying. What you count after running out of fingers is your affair.

As an example, let's say you've traced a section of code in which you're interested to the address, read from CS:IP, of 55AC:3551.

55ac
3551 +
59011h

Why is it so complicated? Blame Intel, not me. For whatever reason, Intel chose the microprocessor architecture so that the segment selects the 64k section of the memory map with which any particular segment is concerned. The offset specifies exactly to where within that 64k segment is being pointed.

In practice all four segment registers are completely independent: they may overlap, coincide entirely, or be at completely different ends of the memory map. ES, SS and DS may be changed in the middle of a program; CS cannot be changed directly or else the microprocessor loses track of where its own instructions are and hangs up.

One consequence of this segment: offset notation is that the expression of an address is not unique. From our example we can see that

59011 = 5901:0001 = 5900:0011 = 5000:9011 = ... = 55AC:3551

Normally, converting a physical address to a logical address is a much simpler affair, as demonstrated in Table 2. And as with the conversion of hex numbers to decimal, most of the time it is not actually necessary to do any converting at all. It is sufficient only to know what's going on.

Following this month's gruelling assault on some of the fundamental concepts, I will deal next month with more advanced Debug tricks, including interrupts – what they are, how to avoid them and how to use them to good advantage. Interrupts are often the first stage in any offensive on the computer, simply because you always know where they are. In the meantime, you may like to get some practice in.

HOMEVIEW

Atari 400, 800, 600XL, 800XL, 130XL, 520ST, 1040ST (callers welcome) 8 Bit Software. All latest software stocked, ring for details

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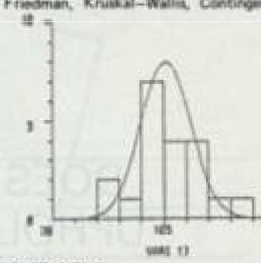
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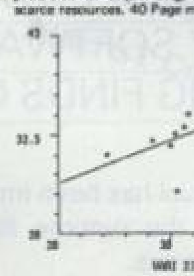
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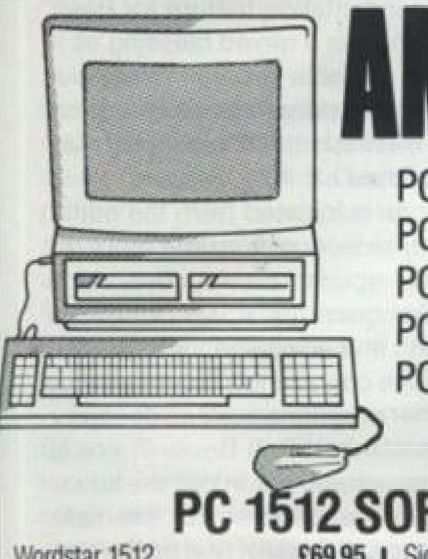
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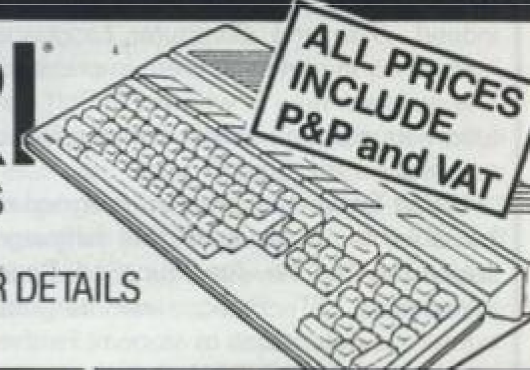
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Fast and Furious

DOES HISOFT'S NEW BASIC COMPILER UPHOLD ITS ENVIABLE REPUTATION FOR HIGH QUALITY SOFTWARE. ADAM DENNING FINDS OUT

Following its international success, Atari's ST home computer is seen by many as *the* 68000-based development machine. Some companies, including HiSoft, develop a great deal of their software using the SE computers as they are fast, easy-to-use and above all cheap. However development machines do need development software to be really useful.

Already there are more C compilers, more assemblers and more Basic compilers developed for Atari's ST home computer than one would expect the market to be able to support. HiSoft supplies a macro assembler called Devpac ST for the computer and its reception has been very favourable indeed. *Byte* and *Computer Language* magazines in particular were impressed. The question now is whether HiSoft can follow its act with HiSoft Basic, a Basic compiler for the Atari ST.

HiSoft Basic is a compiler designed to be able to cope with the language supported by the Atari-supplied Basic interpreter, ST Basic, and to add numerous extensions of its own. Further to this and most useful of all, the compiler accepts the same language as Microsoft's QuickBasic compiler, the standard compiler on the IBM PC. This feature means that software developers who already have programs written in QuickBasic on the IBM PC can transfer them to the Atari ST and re-compile them – in a lot of cases without any changes at all. The same applies to Borland's TurboBasic, which is fairly similar to QuickBasic and HiSoft Basic in syntax terms.

Improved

The product reviewed here is a beta-test release but the full production version of the system will be on sale before this article appears. The only major differences between the product reviewed and that released are that the manual has been improved in places and that the runtime library misses a few functions.

The compiler tries its best to present as friendly an interface to the programmer as possible using a cross between the techniques used in Microsoft's QuickBasic and those enforced upon the compiler system by Gem. As every Atari ST comes with the Gem interface built-in, HiSoft has sensibly decided to use it to its full potential. This means that Basic programmers will become familiar with Gem simply by using the product. In most cases there isn't any requirement to learn more than the Basic statements used to perform a specific action. Obviously certain Gem features do require prior knowledge and a little programming skill, but there is a surprising amount which can be done using Basic's comma.

Old Fashioned

Like all Gem programs, HiSoft Basic (supplied in a file called HBasic. PRG) is run by double-clicking on its icon with the mouse pointer. Presumably it is possible to run the program from a shell-type interface by typing its name at the prompt, but this wasn't tried in this review. The program starts up and immediately enters its full-screen editor, an integral part of the compiler. This editor is very similar to the editor supplied by HiSoft with its Devpac ST assembler requiring users of both products to be familiar with one editor and its command set only. The editor uses Gem quite considerably but also provides key-activated commands allowing old-fashioned users like me to use WordStar-style keys rather than these new-fangled mice things to control the editor.

The editor is by no means a full word processor but it does come in very handy for program editing, its true purpose in life. It edits files in memory, meaning that disc accesses are performed only at the start and end of a session (unless you save in the middle of a session, of course!). It also means that source file size is limited to somewhere around 300K, but this is very unlikely to be a problem as it represents a Basic program size of about 10000 lines (a rough guess!). As HiSoft Basic supports the concept of modular compilation, anyone writing single programs this large needs his head examined.

Frustration

The commands offered by the editor are largely what you would expect: cursor control, block marking, moving, copying and deleting, file reads and writes, search and replace facilities and so forth. It also has an auto-indentation feature for Basic programs which is a mixed blessing as it encourages readable programming, but can cause the experienced programmer immense frustration. Thankfully it may also be switched off.

Compilation is initiated from the editor by selecting an option from the program menu. Other options allow you to run a compiled program (this will initiate a compilation if necessary), move the cursor to a line containing a compiler error and run other programs such as directory utility from within HiSoft Basic. There is also an option available to install the editor to your own preferences; for example you may choose the editor text buffer size (in the range 4000 – 999000 bytes), and you may set the tab size anywhere in the region 2 to 16. As far as we can tell, the command keys used by the editor are not installable, but as a sensible set has been chosen and as the mouse is available, this is not really a setback.

The code produced by the compiler is native 68000 machine code making it extremely fast and fairly compact. Current benchmarks show that HiSoft Basic produces very fast programs indeed. It is possible to generate Gem programs and TOS programs, the latter



being useful when space is at a premium and the windowing facilities of Gem aren't required. Like QuickBasic, sub-programs may be separately compiled and saved away in user libraries for later incorporation into programs. This brings Basic a modicum of respect in the notoriously snob-orientated world of computer languages.

The real strong point in the 'new' Basic's favour is its introduction of useful flow-of-control structures borrowed from other languages. Loops may now be created with WHILE, DO and UNTIL as well as the traditional FOR and NEXT and the infamous but much maligned GOTO statement may be completely left out in most cases. The ultra-useful CASE statement of languages such as C and Pascal is provided too, using Basic's SELECT statement.

HiSoft Basic contains a host of keywords which deal specifically with ST hardware. As Atari seems to have spent a great deal of effort in making its machine seem rather like a 68000 and Gem-based clone of the IBM PC, a lot of these keywords operate in the same way as, and produce the same effects as, their counterparts in popular PC Basics such as GW-Basic, TurboBasic and QuickBasic. Naturally there are a number of commands designed to deal with the graphics interface and some to cope with Gem's extra WIMP facilities.

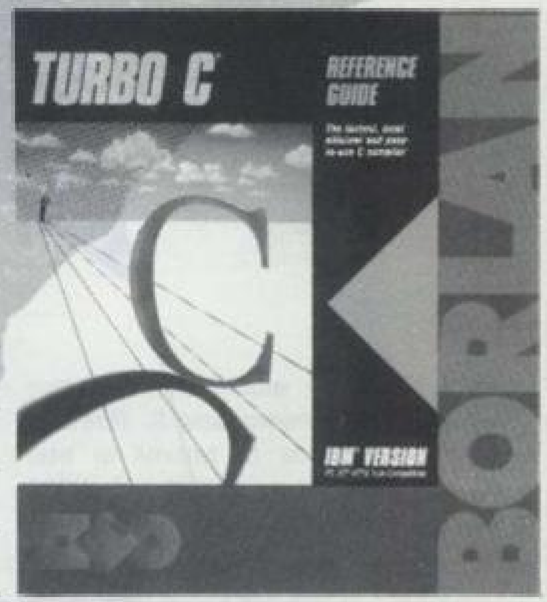
Extensive

It is possible to resort to programming in 68000 assembly language and combining it with compiled Basic programs, but as so many facilities are offered by the language and its function library it is unlikely that this will be required too often. Perhaps there are specific applications such as time-critical port handling where there is no option but to introduce assembler, but in the main this is not the case.

The manual is very extensive, covering operation of the editor and compiler as well as containing a complete Basic language reference guide. There is a large tutorial section for beginners introducing the concept of programming languages and then concentrating on HiSoft's Basic implementation in particular. This tutorial is well-written (by the popular computer journalist Tony Kendle) and contains a large number of examples. Atari ST specifics are discussed nearer the end of the section so that even the novice Basic programmer should be up and running within a couple of days.

In conclusion HiSoft Basic is clearly an excellent Basic compiler. By offering ST Basic and Microsoft QuickBasic compatibility, HiSoft has done itself a big favour. It would seem that this compiler outperforms all other Basic compilers available for the Atari ST and as it is relatively unexpensive (£17.95) it is a good buy. At worst, you get a good editor for program development and at best, you get a phenomenal Basic compiler. As the management of HiSoft is fairly enlightened the company does not charge licensing fees for programs sold which were developed using the Basic compiler, a trend which is becoming increasingly popular amongst compiler manufacturers. It seems now that it's only the COBOL world which expects to pay through the nose for things it could do faster and better in a different language.

TRENDSETTING TURBO



TURBO C IS GOOD AS C COMPILERS GO, BUT JUST HOW GOOD IS IT? ADAM DENNING INVESTIGATES

Turbo C is certainly significant but not necessarily because it is good. It is a good C compiler but it is not the best. Furthermore, the company whose C compiler is the best has just retaliated. And that's what is so significant about Turbo C – it has made everyone less complacent. It seemed that prior to Turbo C's release, any fresh-from-college compiler writer could spend a few months in some darkened basement, push out an average or pretty good C compiler and make enough money out of it to buy a new car. It is clear now that only the best will do and that the price is of far more consequence than ever before.

The price factor is easy to explain. C is a popular language among professional programmers because it can be used to express algorithms efficiently. This has caused an incredible number of C compilers to be sold but because C traditionally is a professional language these compilers have not been cheap.

Professional

Enterprising people have of course tried to change this, some fairly successfully. For example, Datalight in the US and Zorland over here (these products are probably more closely related than we suspect!) both sell high-quality compilers at way under the going rate and have made a roaring trade by doing so.

One suspects that Borland has always regarded itself as *the* prime purveyor of cheap compilers. It certainly qualifies as the prime purveyor of hype. From such a viewpoint, it is inevitable that Borland would try to grab itself as much of the cake as possible. Now that *Turbo Pascal,* Borland's original language product, is reaching the end of its life, the company has been looking to other languages. The bacon must, after all, be seen to be saved.

Borland's original idea was to do for *Modula-2,* Pascal's successor language in theory, what it had already done for Pascal. For various reasons this never came about. Microsoft released *QuickBasic,* a fast and user-friendly Basic compiler for the PC, and it also released Version 4.00 of its C compiler, a product which was acclaimed from all sides. Borland saw its market.

TurboBasic has been reviewed before in this magazine – this is Borland's answer to QuickBasic. It had such an effect that Microsoft released a considerably-updated version of QuickBasic shortly after TurboBasic was widely available. Turbo C is clearly a direct challenge to Microsoft's C supremacy. From a user's point of view, it has had the desired effect in that Microsoft has released version 5.00 of its C compiler, which reputedly steals a march on the Borland product and comes complete with QuickC, the new, fast, user-friendly and cheap C compiler.

What then of Turbo C? For your £99 you get four disks and two perfect-bound manuals – one a user guide and tutorial, the other a reference manual. First problem – find me a professional programmer who can work effectively with perfect-bound manuals. Okay, it's cheap, but it's hardly useful.

Two versions of the compiler are supplied – one using the by-now mandatory menu-driven user interface, the other being a more traditional command-line driven version. Inevitably, even the most seasoned programmer is going to try out the menu-driven system.

Complicated

The menus are a little complicated as there are so many options available. It seems very much the vogue these days for C compilers to offer a large number of compile-time options; some will define symbols to the processor, others will determine the memory model to be used and others will determine the optimisation strategy to be employed. Turbo C is no exception and of course each of these options is available from the menu.

The screen editor supplied with Turbo C is a version of the familiar Borland editor, very similar to the one that comes with TurboBasic. It offers those features you'd expect to find on a program editor, such as block operations, but it does not offer full editing capabilities, such as split-screen multi-file edits, that you can get from dedicated editors such as *Brief.*

If you do not have an editor with which you are already familiar, then it may be that you will use the editor supplied with Turbo C. During this review, I edited source files using Brief and then loaded them into Turbo C. Only the most minor changes were made using the built-in editor.

The editor and compiler are integrated such that, following a compilation which completed with errors, each erroneous line may be selected simply by picking the relevant error from the errors window. The editor moves to the line concerned straightaway. This is fine if you're using the Turbo editor, but obviously only of limited value if you choose to use another editor.

Before examining the compiler itself and the runtime library, brief mention will be made of the other programs supplied with Turbo C. The first of these is a full C pre-processor, which is useful for checking that macros are expanded ways you expect. It can also be used as a general macro-expansion utility, so long as your macros are acceptable to the C pre-processor. This feature is unlikely to be used to any great extent.

Another utility supplied is a linker. This takes one or more Microsoft/Intel-format object (.OBJ) files, none or library files and combines them into a single executable file. A detailed map file, containing public symbol listings and segment values, may be created if desired. If such a map file is created, it may be used as input to certain symbolic debuggers, such as SYMDEB which is supplied with the Microsoft Macro Assembler.

The linker is designed to be, to quote the manual, 'lean and mean'; it has far fewer options than the standard DOS linker but is much smaller and a bit faster. It does allow object files containing line-number information to be linked, allowing source-level debugging with SYMDEB and so forth, but it is unable to create the sort of information required by more powerful debuggers such as Microsoft's CodeView. Also, the Borland linker does not support overlays and is unable to deal with some of the undocumented object file features created by the later versions of the Microsoft languages.

As the linker is designed primarily for Turbo C programmers and those who wish to combine the odd assembler-coded function with their C programs, none of these problems is going to be troublesome. That a linker is supplied at all would until fairly recently have been regarded as highly unusual and, considering the fairly low price of this product, the linker is a welcome part of the package.

The third utility supplied is MAKE. This program-maintenance tool is becoming more and more popular as a greater number of versions become available for MS-DOS machines. Borland's MAKE is one of many and its use encouraged by the company. One reason for this is that the integrated environment performs a great deal of MAKE-like processing, such as compiling source files only when they have changed, or when one of the files included by a source file has been changed.

Useful

Certainly MAKE and its occasionally-useful colleague TOUCH (for updating a file's 'last changed' date) are powerful program maintenance utilities which are tremendously useful on large projects but it's difficult to see the typical Turbo C user wanting to be bothered with it all. Borland obviously wants to aim Turbo C as much at the professional programmer at at the newcomer to C.

A number of example programs to accompany the tutorial is also supplied with the compiler.

Now on to the compiler itself. All the comments and timings presented below were gathered using the integrated environment version of the compiler on a standard 4.77MHz 8088 PC with a 20MB hard disc and running DOS 3.10.

The first thing you notice about Turbo C when you compile a program is that although it is very much faster at compiling than the majority of conventional command-line compilers, it's not quite as fast as you expect. It still has to include files, write the object to disk, link the files and so forth, so it still takes a decidedly finite amount of time to create an executable program from a source text. If you split your program into a number of separate files, which every programmer should, then you also need to create a 'project file' listing the files to be incorporated into the final build.

Faster

Unlike other Borland language compilers, Turbo C is unable to generate its executable code in memory, rather than writing it to disk. This is because the C language was designed so that machine dependent operations, such as input and output, are not part of the language but part of a runtime library with which the program's object code is linked after it has been compiled. There is no way in which Turbo C sensibly can get over this, so it makes the linkage process explicit and essential. Despite all this, it took Turbo C only 42 seconds to compile and link a 600-line program and a 30-line file containing a single function, while Zorland C V2.00 (generally considered to be a very fast compiler), took 60 seconds to do the same thing.

The language accepted by the compiler is very close indeed to that supported by V4.00 and later of the Microsoft C compiler. This is essentially C as recommended by the ANSI committee together with a few extensions to help circumvent the quirks of the Intel 8086 family of microprocessors (segmentation, for example) and some to help integration of products with new OS/2 things, including Microsoft Windows. Like Microsoft C, Borland C accepts PASCAL, HUGE, CDECL and the other Microsoft 'extended' keywords.

It is acknowledged, grudgingly by some, that a C compiler for MS-DOS and OS/2 machines must accept these and a few similar extensions if they are to be truly useful to the professional software developer.

Extensive

A potentially useful extension keyword not offered by other C compilers is the interrupt modifier. This tells the compiler that a function is to be invoked by interrupt code rather than by being invoked as a matter of course from the command line. Such a function will be compiled with special interrupt-handling taken into account, including regiser saving.

The library supplied with Turbo C is extensive and covers all fields from basic input and output, through string operations and memory allocation, to specialised functions such as DOS and assembler interface functions. The library clones the Microsoft library in a large way, but Borland has also added a good number of its own functions; some are useful, some may not be quite so. This is always the case with compiler runtime libraries, no matter who writes the. Considering that Microsoft wrote MS-DOS, it is perhaps a little odd that Borland's Turbo C should be provided with a larger number of DOS interface functions than Microsoft C.

The big question really is how fast and how compact is the code produced by the compiler? If you cheat and turn all sensible things off, then naturally you'll get a small and fast executable file. However, I think that most programmers would leave certain things on, such as stack frame allocation (allowing recursion and dynamic parameter handling). This results in slightly larger and slower programs but at least you can write programs in the knowledge that what you're trying to do is actually supported.

Running the standard *Your Computer* C benchmarks showed that Turbo C produces very fast code indeed. It competes easily with compilers such as **Lattice C** and beats Microsoft and Zorland most of the time too. The code size is pretty reasonable, being around 3800 bytes for the integer benchmark programs and around 19500 for the floating-point tests (using the emulator library rather than the 8087 library). The only problem was with test 15, involving point trigonometry, particularly the SIN and LOG functions. This test was compiled without error but when run it caused an error message

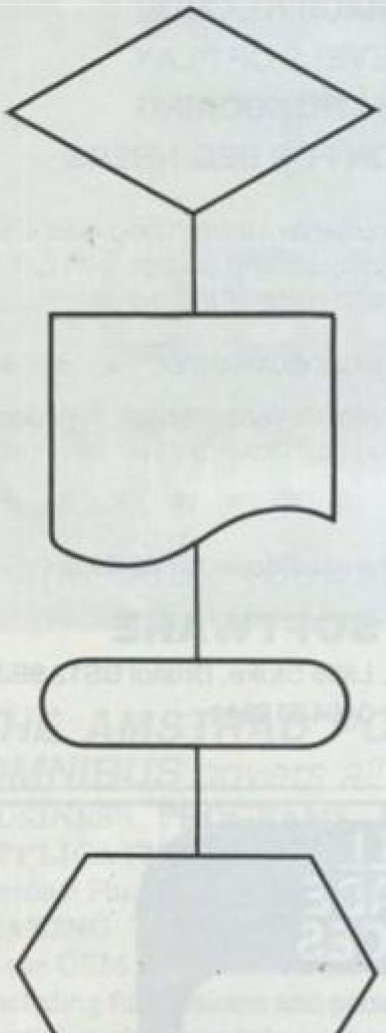
sin: TLOSS error

to be produced and the machine to lock up. This presumably is a library problem.

Borland Turbo C is capable of producing code for the small, medium compact and large memory models as well as a tiny memory model and one equivalent to Microsoft's huge model. This makes the compiler very useful indeed and it shows that with this product at least Borland is capable of offering serious competition to Microsoft.

For entry-level programmers, Zorland C remains a better bet than Turbo C. For full-time professional programmers we have to be honest and say that we expect Microsoft C to maintain its top position. This leaves the middle ground, that area inhabited by a great number of people who know that they want to program in C but who don't necessarily do it every day. With a product like this, most of this slice of the market could well go to Borland.

ADVENTURE BUILDING



PETE GERRARD LOOKS THIS MONTH AT THE ADMIRABLE BENEFITS TO BE GAINED FROM USING RAM SAVE

It seems reasonable to assume that if at least one person is having difficulty with a particular piece of adventure writing, others will also be having problems with the same subject. So a plea for help from a friend on how RAM SAVEs work leads me into this month's article.

Needless to say we will not be discussing only that but every adventure game in the world seems to feature a RAM SAVE option and every adventure certainly should have some facility for allowing the player to save his progress. I once wrote a fairly accurate implementation of the original *Colossal Cave* adventure for the Commodore 64 and then was criticised for not including a save game option. Arguing that the original did not have such an option was to no avail so we have to assume that everyone wants to be able to save their progress in one form or another.

That is fair enough, as only legendary adventure game-solvers can make their way successfully through a game in just one sitting. I could mention John Ryan, solver of the Infocom *Wishbringer* in one day, but most of us are not in that league. To be of any lasting value, an adventure should take much longer than one sitting to solve and hence the need for a save game option. This permits the player to live to fight another day, pondering on his fate as he lies dangerously close to being eaten alive by grues or guforms, or whatever fate the adventure writer has left in store for him.

The first thing to consider is which words you will use to allow the player to select the save game option. For a long time I used to stick to the verbs SAVE and LOAD, until I wrote my first Western adventure and realised that players wanted to LOAD a GUN; sensible enough under the circumstances, I suppose. Then, as in so many other things, I followed Infocom and moved to using SAVE and RESTORE. Those two verbs should be added to your verb list and be capable of being recognised by the adventure.

Then we have the problem of where to save the information. In other words, do we use tape, disk or just RAM? Tape is slow, disk is faster, while RAM is virtually instantaneous. All computers obviously have RAM and you will probably have more than 100 or so bytes remaining after writing your game, which will be about all we shall need to use. Your game will be written and stored on tape or disk, so it makes sense to use that same medium for saving and restoring progress.

DISKS

For now I consider disks, since all my adventure work these days is done with disk drives, but the principles are exactly the same for tape. Apart from two lines of code the programs are exactly the same as well, which means there will be no major changes required if you are compelled to use tapes.

The problem of whether to use random or sequential files for the information storage doesn't really arise since the amount of infomation being stored is not that great. Unlike Infocom, for once, I don't save what amounts to virtually a copy of the entire game – only those parts of it which vary. All the files will therefore be very small.

I say all the files because if you go to the trouble of including a save game feature you might as well make it useful and allow more than one saved postion to be used. That prevents the player having to use a different disk for every game save he makes, although for tape users it really makes no difference.

You can have hundreds of files with the same name on the same tape but disks tend to object to that. Usually I use give save and restore features for one disk. I also assume usually that the player will save his progress on to the disk on which the game is supplied. I rarely protect adventures on disk, so anyone can take copies of the game disk if they fear the pos-

- **Pete Gerrard's magic formula for saving game positions.**

sibilities of data corruption. That dispenses with the need for prompts to remove game disk and insert data disk.

RAM DISK

If the machine on which you are working has the luxury of a RAM disk you might as well use that as well. Added to our normal RAM SAVE feature it means that a player might have up to 15 different saved positions at any time. More than sufficient for most people, I imagine, although 10 of those saved positions will be lost when the power is turned off at the end of the day or at four o'clock in the morning. If you are like most adventure game fanatics.

Although the listing was produced on an Amstrad PCW 8256 it will, with only minor modifications, run on almost any home computer.

Line 1020 prints a message requesting the player to select where he wants to save or restore the information to or from. It is the same for both verbs and could be used only once if you are a little low on memory. On most machines you would have to take out the reference to drive M:, this being the RAM disc on the Amstrad PCW.

Lines 1022 to 1024 then receive the input from the player and make sure it is a valid one, echoing it to the screen if it is. The ASCII values of capital letters on the PCW begin at 65, lower-case ones being at 97, hence the '-32' bit.

Lines 1100 to 1122 then save the information in a variety of formats depending on what the player has selected after having found out in which game position he wants to store everything. Line 1105 opens a file to the RAM disc if that is what the player wants, or goes to line 1120 if a RAM save is the thing, while line 1106 opens a file to the ordinary built-in disk if the player has chosen drive A: as his option.

LATER

To alter these for, say, a Commodore 64, you would have to change the OPEN statement to read something like:

OPEN 2,8,2,aS+",S,R"
INPUT #2,CP,PD,NV,NN ... etcetera

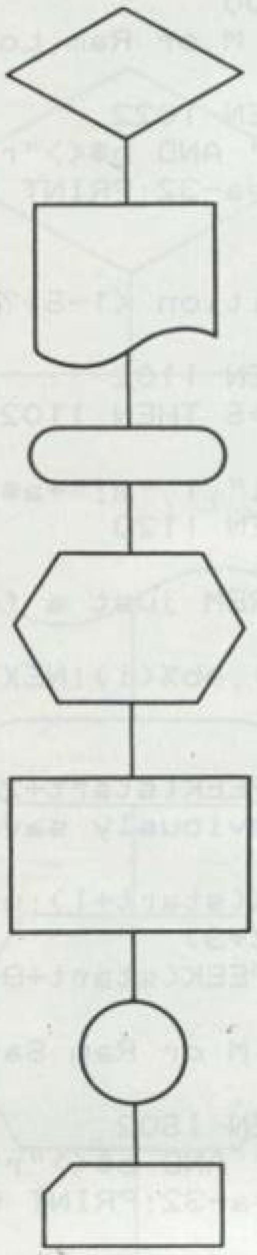
which will open a sequential file to disk. Lines 1110 and 1112 will also have to be altered, to change the INPUT #1 to INPUT #2 and CLOSE 1 to CLOSE 2 respectively.

```
Saving Game Positions

1000 IF vb$="quit" THEN CLOSE:PRINT cls$
:PRINT CHR$(27);"X";CHR$(32);CHR$(32);CH
R$(60);CHR$(121);:END
1002 IF vb$<>"save" AND vb$<>"load" THEN
 10
1010 IF vb$="save" THEN 1500
1020 PRINT "Drive A, Drive M or Ram Load
 (press A, M or R) ";
1022 b$=INKEY$:IF b$="" THEN 1022
1023 IF b$<>"a" AND b$<>"m" AND b$<>"r"
THEN 1022 ELSE a=ASC(b$):a=a-32:PRINT CH
R$(a)
1024 GOTO 1100
1100 PRINT:PRINT "Game Position <1-5>? "
;
1102 a$=INKEY$:IF a$="" THEN 1102
1104 a=VAL(a$):IF a<1 OR a>5 THEN 1102:E
LSE PRINT a$
1105 IF b$="m" THEN OPEN "i",1,"m:"+a$:G
OTO 1108:ELSE IF b$="r" THEN 1120
1106 OPEN "i",1,a$
1108 INPUT #1,cp,pd,nv,nn:REM just a few
 variables
1110 FOR i=1 TO 20:INPUT #1,ob%(i):NEXT:
REM just a few more
1112 CLOSE 1:GOTO 10
1120 start=62000!+a*25:IF PEEK(start+24)
<>255 THEN PRINT "Not a previously saved
 position ...":GOTO 10
1121 cp=PEEK(start):pd=PEEK(start+1):nv=
PEEK(start+2):nn=PEEK(start+3)
1122 FOR i=1 TO 20:ob%(i)=PEEK(start+3+i
):NEXT:GOTO 10
1500 PRINT "Drive A, Drive M or Ram Save
 (press A, M or R) ";
1502 b$=INKEY$:IF b$="" THEN 1502
1503 IF b$<>"a" AND b$<>"m" AND b$<>"r"
THEN 1502 ELSE a=ASC(b$):a=a-32:PRINT CH
R$(a)
1504 GOTO 1600
1600 PRINT:PRINT "Game Position <1-5>? "
;
1602 a$=INKEY$:IF a$="" THEN 1602
1604 a=VAL(a$):IF a<1 OR a>5 THEN 1602:E
LSE PRINT a$
1605 IF b$="m" THEN OPEN "o",1,"m:"+a$:G
OTO 1608:ELSE IF b$="r" THEN 1620
1606 OPEN "o",1,a$
1608 PRINT #1,cp,pd,nv,nn:REM store a fe
w variables
1610 FOR i=1 TO 20:PRINT #1,ob%(i):NEXT:
REM just a few more
1612 CLOSE 1:GOTO 10
1620 start=62000!+a*25
1621 POKE start,cp:POKE start+1,pd:POKE
start+2,nv:POKE start+3,nn
1622 FOR i=1 TO 20:POKE start+3+i,ob%(i)
:NEXT:POKE start+24,255:GOTO 10
```

ADVENTURE BUILDING

CONTINUED



The rest of this section – lines 1108-1112 – can remain as it is.

The interesting stuff begins at line 1120, which is where we start the RAM SAVE side of things. Being RAM, it means that any information put there will remain accessible only for as long as the computer is switched on, disappearing into oblivion as soon as the power is removed. It means that the player can save and restore his position in the game very quickly if, for example, he is about to encounter a sharp-shooting outlaw and doesn't know what to do. Save the position, meet with disaster against the outlaw, so restore the position and try again. Very fast and easy and it does not take vast amount of memory.

It seems that the most sensible place to use for our RAM SAVEs would be the top of Basic memory, that part which is not used by the adventure program. Whether you keep your adventures as Basic creations or compile them into pseudo-machine code, you will not use all the available memory in your computer, thus leaving aside some which can be used for this RAM SAVE feature.

HIMEM

To implement this we need to know where the top of Basic RAM is on the computer. Many computers have as a command the keyword HIMEM which, when PRINTed-out, will indicate the address of the highest byte accessible by a Basic program. In other words, this is the last possible byte you can use while programming in Basic – or machine code, they both occupy the same memory.

Another keyword found on most machines is FRE, which tells us how much memory remains after your Basic program is up and running. So, in theory, we can run the adventure program, having already found what value is returned by printing-out HIMEM, and then type PRINT FRE(O) to see what amount of memory is left.

It is much easier if we use an example. On the Amstrad PCW, printing-out HIMEM will tell us that the top byte of memory used by Basic is 62981. After running a large program and typing PRINT FRE(O) we might get the result 2021. 62981 minus 2021 is 60960 but the number of bytes a Basic program uses can vary considerably. Just try repeatedly defining a string A$ equal to "fred" and printing-out the amount of free space each time.

The effect of doing this differs markedly from machine to machine but some of them eat up memory every time you re-define a string. Others recover the memory used previously to store the string and re-assign it to the new string. The overall effect, however, is usually the same, particularly so far as adventures written in Basic are concerned: a program will eat up more and more memory as more and more strings are defined or re-defined and at any time the value given by FRE(O) might be a kilobyte or more removed from the true size of the program once everything has been set up.

So take our value of 60960 and add a kilobyte to it, giving us 61984. Since that is not a particularly easy number to remember, I opted for 62000, the value used by the example program.

VARIABLES

Line 1120 then uses this start value PLUS the result of multiplying the variable 'a' – the value that the player has given to the save position – by 25, as this example uses 24 variables and there is a 25th 'test' variable, which determines whether or not the position has been used previously. If it has, there will be a value of 255 stored in the 'test' position, which is what the end of line 1120 is checking. Assuming everything to be satisfactory, the variables are recovered by PEEKing at the memory locations, this being by far the easiest way of saving and recovering data from a string of memory locations.

What if the location were accidentally to contain the value 255, as it might well do at power on? We need a line 0 to the program, which would run something like:

0 FOR I=0 TO 124:POKE 62000!+1,0: NEXT

thus ensuring that every location to be used by the RAM SAVE procedure initially contains the value zero. Incidentally, the exclamation mark after the number 62000 is a feature of Mallard Basic – lines 1120 and 1620 also show this – and is entered by the machine, not the user. In other words, enter line 1620, for instance, as:

1620 start = 62000+a*25

and let the Amstrad worry about the exclamation mark; it will put it in.

Every computer cannot expect to have Basic memory ending at location 62981. Not every computer has a HIMEM command to tell you where it ends and so in some cases you will have to do a little detective work.

Some popular home computers make life easy for us by having convenient 'gaps' in memory which allows us to store data. The Commodore 64 is one and for that computer the value 62000 could be replaced by 49152, this being the start of a most useful block of 4K of empty memory above and beyond the call of Basic.

Most computer manuals, however, tell you where the top of Basic is, so take that value – like 62981 – and subtract roughly a kilobyte from it, leaving plenty of room for us to store our data and for Basic to expand as variables are allocated and strings are defined.

Lines 1500 to 1622 perform the analogous task of saving the data, including the all-important POKE location with 255 to tell the program it really is a previously-used RAM SAVE position. Line 1622 does this. All is very much the same as with the RESTORE routines, with the Commodore 64 equivalent of line 1606 being:

1606 OPEN 2,8,2,a$+",S,W"

and all the PRINT #1 and CLOSE 1 statements being replaced by PRINT #2 and CLOSE 2 statements respectively. Everything is, in other words, all part of a series of sequential files of data, the only difference being in the RAM SAVE option, where it becomes a series of successive locations in memory.

The only problems you might encounter with this method of RAM SAVE are if you were using strings instead of simple numerical variables, or you were trying to store values greater than 255. As we saw in an earlier article, 8-bit computers cannot store values greater than 255 and so some way would have to be found around that. The simplest thing would be to split the variable in question into two bytes, by the method of:

HV=INT((value)/256):LV=(value)–256*HV

where (value) is the number in question. HV becomes the high values and LV the low value. Thus if (value) was equal to 1036, HV would become 4 and LV would become 12.

Strings are slightly more difficult, but the only real problem is in the amount of memory that they take. Again, approaching things from the simplistic point of view, you could strip down a string into the ASCII values of the individual characters in it and store those in successive memory locations. Thus you might have something like:

FOR I=1 TO LEN(string$):A=ASC(MID$(string$,I,1)):POKE start,A:NEXT

assuming string$ to contain the string in question, and with 'start' obviously varying from one computer to another and from one saved game position to another. Given the foregoing line of code, everything can be stored as part of RAM.

ERROR

In addition to all code we have seen so far, some more work is required before the routine is complete. We have not yet checked for the existence of previously-saved positions when a player tries to restore one, i.e., if the player wants to restore position three but has not yet saved a position three. With the RAM SAVE this has been done by POKEing that value of 255 into the 25th location of each saved section of memory but files on disc, for RAM discs for that matter, need something else.

The form it will take varies tremendously from computer to computer, depending on exactly how the machines prefer to save their files on disc. For Commodore machines, trying to read a file which does not exist will not affect the running of the program but obviously will produce erroneous values for the variables. The thing to do here would be to have another routine which is called before any attempt is made to open the files for saving or restoring. That could read the error channel and find whether the file in question really exists. If it does, continue as before but if it does not, close everything and tell the player he is looking for a saved position which is not really there.

Life is much simpler on other machines with an ON ERROR GOTO command, such as the Amstrad PCW. Tagged to the end of our line 0 we could have:

ON ERROR GOTO 1700

where 1700 would read something like:

**1700 IF ERR=53 THEN PRINT"Not a previously saved position...":
RESUME 10
1701 PRINT "Fatal error...":END**

Here, if the variable ERR contains the value 53, we know this to mean that the program has been trying to access a non-existent file on the disk. Since the only time that could happen in our adventure program is when a restored popsition has not previously been saved, we can deal with the problem easily enough. If you wanted to be really careful you could use the variable ERL to find from which line this error routine was called.

Line 1701 is perhaps a little drastic and would not appear in the final version of the game, since END would let the player look at all the code and possibly figure how to get through the adventure. It can remain for error trapping purposes while debugging, so long as you remember to remove it in the end.

ERR and ERL are two extremely useful reserved variables in Amstrad Basic, since they tell us what the error is and in what line it occured. Other manufacturers, please take note

Character manipluation is something we shall tackle in more detail next time but for now a few thoughts and ideas to whet your appetite. Even the original adventure of them all, good old *Colossal Cave*, had something of this character manipulation flavour about it, with the annoying pirate stealing your treasure and the even more annoying dwarf leaping on you from time to time and indulging in a knife fight. There was nothing particularly sophisticated about those two and later adventures proved something of an advance on those early ideas.

CHIEFTAINS

The Infocom *Starcross* had a host of characters in it, from native chieftains with whom you have to barter to get a brown rod, to enormous spiders with a fascination for tape recorders and meeting along the way the infuriating mechanical mouse. He had a capacity for going through a hole in the wall which closed behind him immediately, thus barring your progress. A tricky problem, until solved with the aid of two thin disks.

Other games, like *Lord of the Rings* and *The Hobbit*, featured characters of varying degrees of intelligence, including the now-legendary Thorin and his total inability to do anything other than sit down and sing about gold, or so it seemed.

Other beings seem to be an essential part of most adventure games, so how do we control them? If you remember Colossal Cave you will no doubt recall the bear, a ferocious beast easily tamed with a morsel of food and, once freed from his golden chain, blessed with the ability to attach himself to you like a limpet and follow you around for days. He would follow you on to the bridge too, if you were not careful, sending you both plummeting downwards into a bottomless abyss while reaching for the orange smoke. Something like that is relatively easy to program. Once the bear has been fed and the chain removed we could set a variable flag, BF for example, and then every time we reached the WHAT NOW prompt check to see whether or not BF was set. If it was, then print the message "You are being followed by a large, tame bear," but if it was not, print nothing and just continue as normal.

Character could be given to the bear easily. If, for instance, you dropped two things at the same time and the flag BF was set you could print "As you drop the (whatever) the bear runs away, thinking you're throwing something at it. However, it soon calms down and return to your side." When you approach the bridge and the troll asks for his treasure and, provided once more that the bear flag is set, you would print "The troll screams at the sight of the bear and runs away shrieking, the bear starts to follow but soon comes back to your side again." That way you solve the problem of the troll but still leave the player with the possibility of walking on to a rickety old bridge with an enormous animal by his side. The weight is more than the bridge can bear, of course.

The dwarf and the pirate similarly are easy to program. Provided that the player's current position falls within a given range – you cannot have the dwarf leaping from behind a rock in the well house – you could use the random function of your computer. Like this:

IF CP>10 AND CP<50) AND INT(RND(5)* 100+1)>95 THEN DF=1

Here we set the dwarf flag. Program control can now leap off somewhere and engage you in a duel with the dwarf. Checking for the pirate would follow the same kind of lines:

IF CP>30 AND CP<40) AND INT(RND(5)* 100+1)>98 THEN PF=1

and again you would set the appropriate flag. Then, by whisking program control away somewhere you could check to see whether the player was carrying any treasures or not and, provided that he was, remove them from him and let the bearded pirate carry them to his treasure chest deep in the maze, with a yo ho ho and a bottle of rum thrown in for good measure. If he was not carrying any booty worth stealing, continue as if nothing had happened.

That is all relatively straightforward and presents no great difficulty the on programming front and would probably suffice for most adventures. We Gerrards, however, are never satisfied and so next month we will look at animated characters which play a real part in the game. You can talk to them, get them to do things for you, and generally make then into an essential part of your adventure.

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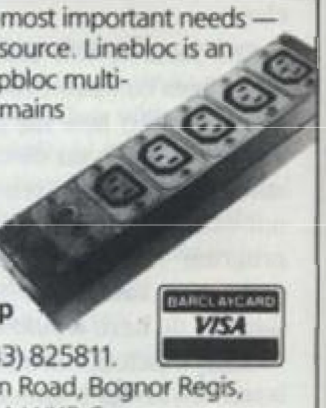
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